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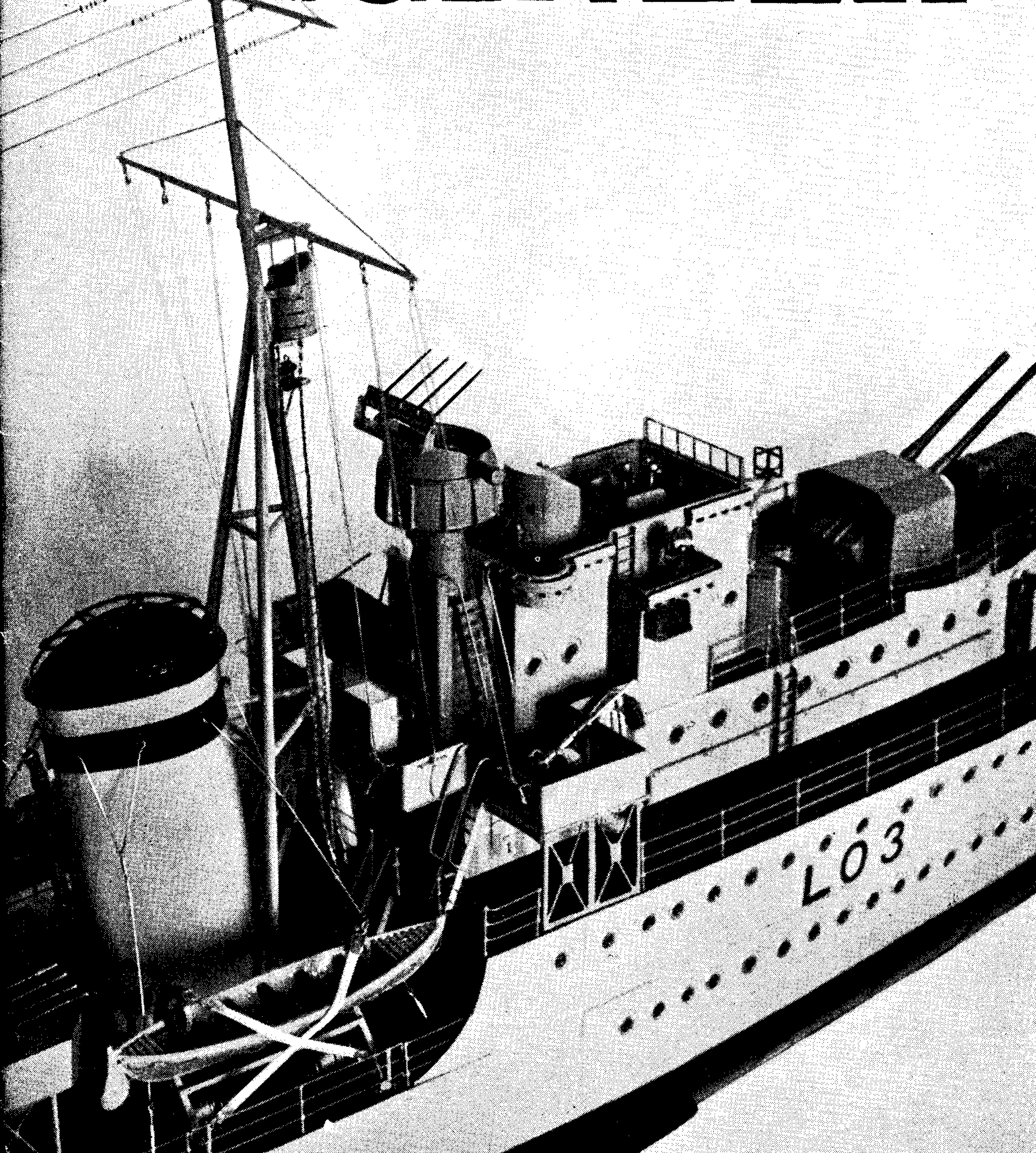
THE MODEL ENGINEER



The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

13TH NOVEMBER 1952 VOL. 107 NO. 2686

SMOKE RINGS

Our Cover Picture

● THIS WEEK'S photograph gives a close-up view of the deck details of the fine working model of H.M. destroyer *Cossack*, made by H. Macklin of Dovercourt, which many of our readers will have seen at the recent "M.E." Exhibition. It gives a good impression of the amount of work involved in modelling the superstructure of this type of vessel. In making such a model, the narrow beam and tall superstructure make it imperative that all above-deck fittings should be built extremely light so as to preserve the stability of the model under working conditions.

"A Small Imitation . . . ?"

● EVEN IF one accepts the pocket dictionary definition of a model as "a small imitation of the real thing"—often used in a faintly derogatory sense by those who do not comprehend the purpose of model engineering—there is more art and craft in producing a "mere replica" model than meets the eye. In the course of many discussions with constructors of miniature models, we have seen something of the methods which have to be improvised, usually with very limited or even inadequate equipment, to produce small but essential details. It should always be remembered that though one may copy the design of a locomotive, a ship or other object most meticulously, the constructional methods and appliances employed in full-size practice are rarely available, and indeed, are often inapplicable. One exhibitor at the recent "M.E." Exhibition described how he made the working hinges of a tiny cabin door from sections of a hypodermic needle; another produced a "cut-glass" effect by machining Perspex with an ornamental turning tool. Many accounts were given of how a lathe had to be adapted, by means of jury-rigged and "Heath-Robinsonesque" attachments, to tackle some very tricky planing, milling or slotting operation. Materials never dreamed of by the full-size engineer often had to be pressed into service. The moral is that one should never despise the "mere copyist"; the superficial appearance of his work may conceal a world of individual ingenuity.

The Dean Bogie

● ONE OF the most elaborate of locomotive bogies, but used with conspicuous success on 4-2-2 and 4-4-0 express engines on the Great Western Railway between 1894 and 1910, was the one designed by Mr. William Dean, locomotive superintendent of the G.W.R. from 1877 to 1902. It was an adaptation of the then standard carriage bogie, and we were greatly interested to find in the Loan section of the "M.E." Exhibition an exact miniature, to $\frac{3}{4}$-in. scale, in course of construction. It is the work of Mr. D. G. Webster, of Maidenhead, who plans to complete it exactly as in the prototype, except that fabricated parts are being used instead of castings. In all other respects, the elaborate prototype design is being followed implicitly. In its present state, it can be appreciated more than it will when, complete and finished, it is installed under the $\frac{3}{4}$-in. scale 4-2-2 engine for which it is intended.

A Model Making Film

● MODEL MAKERS would be interested in a documentary film, No. 423, "Museum Models," recently made by Pathe Pictorial, which shows the official model makers, Mr. Julian B. Glossop, and Mr. A. D. Trollope, at work in the Imperial War Museum. These are two of the group of nine modelmakers who made the model of H.M.S. *Magpie*, which was presented to H.R.H. The Duke of Edinburgh, at the opening of the "M.E." Exhibition. The film may be seen at suburban and provincial cinemas.

Twist Drill Grinding

● THE ARTICLES which have appeared in THE MODEL ENGINEER recently on the subject of twist drill grinding jigs have aroused a lively controversy, which at present shows no signs of abating. So many letters, in fact, have been received from readers, that we have been reluctantly obliged to call a halt to the discussion. There are, apparently, two diametrically-opposed schools of thought on this subject; one regards the use of a scientifically-designed grinding jig as practically essential to enable drills to be used to the best advantage, in respect of accuracy and cutting efficiency, while the other considers them to be a needless complication to workshop equipment, and states that with reasonable care and skill, hand grinding will produce sufficiently accurate results for all practical purposes. It is noteworthy that in both schools of thought, intelligent and logical arguments are advanced in support of these contentions, and by craftsmen of proved ability and experience; it may, however, be observed that, generally speaking, the "jiggers" represent modern tendencies in workshop practice, while the "anti-jiggers" are mainly of an older school in which the hand and eye of the craftsman were superior to his available equipment.

Perhaps we may be allowed to sum up this argument by saying that while drill grinding jigs are undoubtedly highly desirable for consistently efficient and accurate work, it would be a bad thing to give model engineers in general the idea that such work cannot be done without them. We do not disregard the fact that in the highest class of industrial work, mechanical devices to facilitate tool grinding are rapidly becoming universal, but as we have so often pointed out, such measures are often forced upon industry by the scarcity of skilled workers; conditions in the home workshop are by no means parallel or even comparable with industrial practice. While it is unlikely that even the die-hards of the old school would suggest that one should not take full advantage of mechanical aid to grinding where they are readily available, neither can the most up-to-date of the modern school deny that good work can be, and indeed has been for many years, done by competent craftsmen without them. Precision work does not date from the invention of the twist drill grinding jig, or even the twist drill itself; but it has been greatly facilitated and speeded up by both these innovations.

We fully endorse all that has been said in favour of drill grinding jigs by their designers and supporters, and we encourage our readers to construct and use them. But such appliances, in common with all other mechanical and scientific devices, are good servants but bad masters. There is a danger—by no means an insignificant one—that if one comes to rely entirely on mechanical aids, one is not only helpless without them, but also tends to lose the skill of hand and eye which is absolutely indispensable to good engineering,

Most of our readers who decide to construct drill grinding jigs and other items of workshop equipment do so because they see in them something interesting and useful to make—and this, in itself, is a good and sufficient motive for doing so. The love of good tools good workmanship, and ingenious methods, is the root of all craftsmanship, and engineering in particular; it is the mission of THE MODEL ENGINEER to foster and promote this in every possible way, but it is equally important to encourage the initiative and resource of the creative craftsman who can produce good work with little more equipment than his own hands and brain.

Man Versus Machine

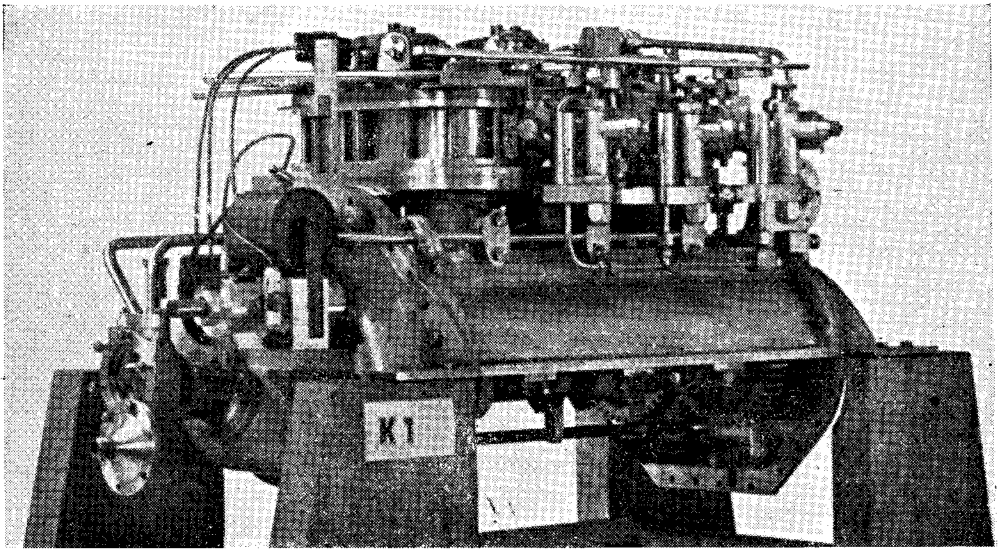
● THERE ARE people so tactless that, on being shown some really superb example of model engineering, will exclaim to the constructor: "You must have a wonderfully equipped workshop!" To the uninitiated, a direct connection between the quality of the workshop equipment and that of the work produced by its aid, may seem quite logical or even self-evident; yet experience does not support the view that such a connection exists at all. Some of the most outstanding models which have appeared at "M.E." Exhibitions in the past have been produced with extremely simple, and indeed primitive equipment, and from such information as we obtained from the entry forms for this year's Exhibition, many of the competitors are still working under difficulties due to the limitations of their tools and appliances; in many cases excellent models have been made without a workshop. On the other hand, it is the exception rather than the rule for the really well-equipped workshop to be used for the construction of models at all; it is more likely to be kept fully employed making tools and fixtures for the workshop itself, or in some cases for highly specialised experimental work. We know of quite a number of readers who possess workshops with a really breath-taking array of tools and equipment, which are their pride and joy, yet they confess that they have never—or hardly ever—constructed a model! This may seem to be a paradox, and we do not suggest that in order to turn out good work, model engineers should practise a kind of self-denial by limiting themselves to the most inadequate equipment possible; by all means use the best equipment you can obtain, but do not regard it as the most important thing in model engineering; what really matters is skill and initiative, allied with patience and determination. The successful model engineer is not a slave of the machine, but on the other hand, can use the simplest machines to good advantage, and triumph over the limitations of the most inefficient workshop equipment.

Internal Combustion Engines

at "The Model Engineer" Exhibition

by Edgar T. Westbury

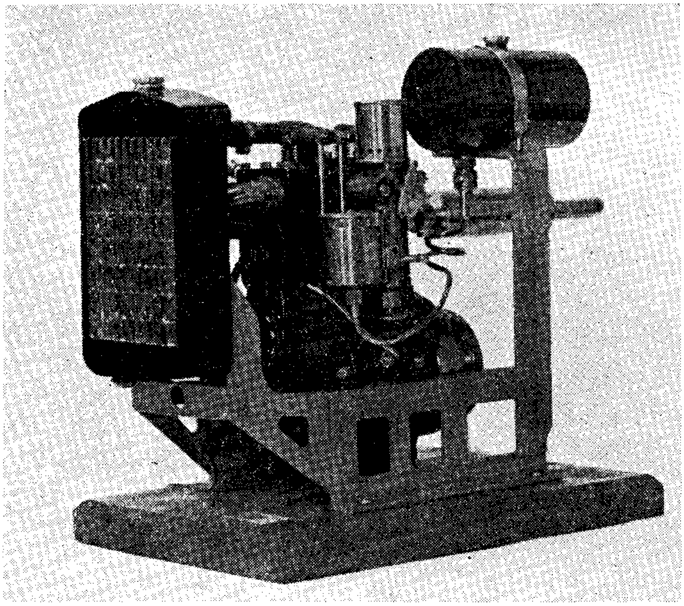
BOTH the number and variety of the engines in this section showed an improvement over the last two or three years, and almost without exception contained some really good workmanship, while the individually-designed engines embodied many ingenious features. It has often been observed that, from the Exhibition aspect, internal combustion engines are usually under the handicap of having their most interesting parts concealed, and this applies particularly to the most modern types of engines. The exhibitors in this year's Exhibition apparently realised this, and in at least two cases, took steps to render the internal parts visible.



The 3-cylinder double-piston engine by Mr. A. W. Purchas

Competition Section

One of the most interesting engines that we have seen for several years was a three-cylinder double-piston marine engine by Mr. A. W. Purchas, of Bishop's Stortford, Herts. It is described on the entry form as an " opposed piston " engine, but this is not strictly correct, as the pistons operated side by side in the vertical plane, instead of in the same axial plane but opposed in phase. The pairs of pistons are connected, by the usual form of connecting-rod, to two separate crankshafts, which are geared together, and thus, although the pairs of pistons do not balance each other, it is possible to obtain excellent dynamic balance, as the rotating parts oppose each other, and it becomes possible to balance out reciprocating weight. The object of the constructor of this engine has been to produce an engine suitable for propelling a twin-screw boat, and from the engine dimensions and capacity, it would seem that quite a large boat would be necessary to do justice to the power of which it should be capable. A noteworthy feature of the design is that whereas nearly all previous examples of double-piston i.c. engines have been of the two-stroke type, this one is a four-stroke engine, having a normal inlet and exhaust valve arrangement, operated by push-rods and rockers, from a camshaft running the full length of the engine, and driven from the crankshaft by spur gearing. The valves are located, so far as could be seen from the external view of the engine, over the centre of the cylinder barrels, and the plug is situated between them, that is to say, over the communicating passage between the cylinder bores. From the purely functional point of view, it is not certain that any real advantage would be obtained by the particular valve and piston-head arrangement in a four-stroke engine, but it may be that the designer considers that the improved



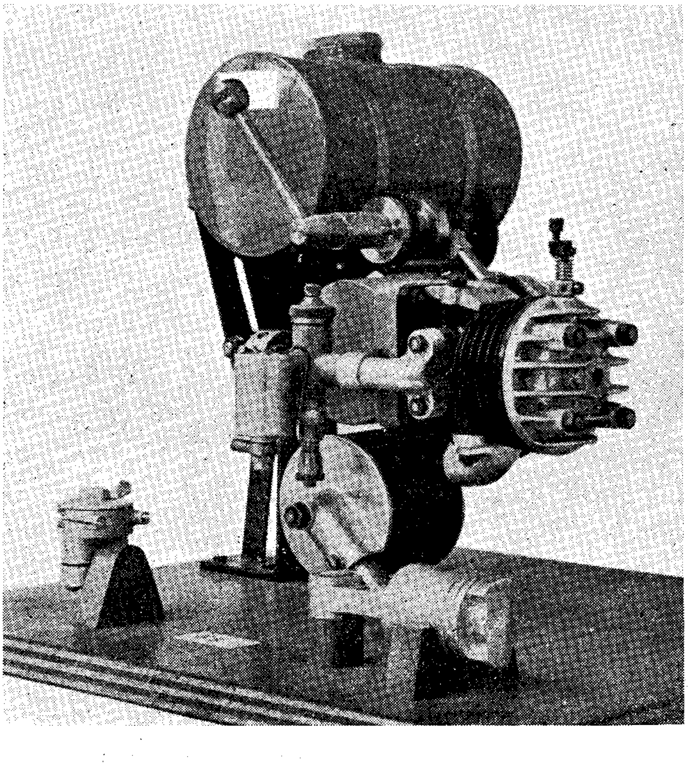
An "1831" engine by Mr. A. W. Brookes

chambers. The carburettors are similar in principle to the "Atom" type of carburettors, having annular diffusers, submerged jets, with air bleed and needle adjustment, and by-pass jets for slow running. The throttles, which are interconnected, are of the butterfly type. A small centrifugal pump is fitted for circulation of cooling water through the jackets, and an ingenious self-winding ratchet starter gear is fitted to one of the crankshafts. Ignition is provided by a M.I. miniature magneto and a high-tension distributor. The workmanship appears to be fairly well carried out, including some rather difficult operations, especially on joint faces, some of which have had to be filed out and hand-scraped; all joints are metal-to-metal. As an example of experimental design, it is worthy of serious consideration.

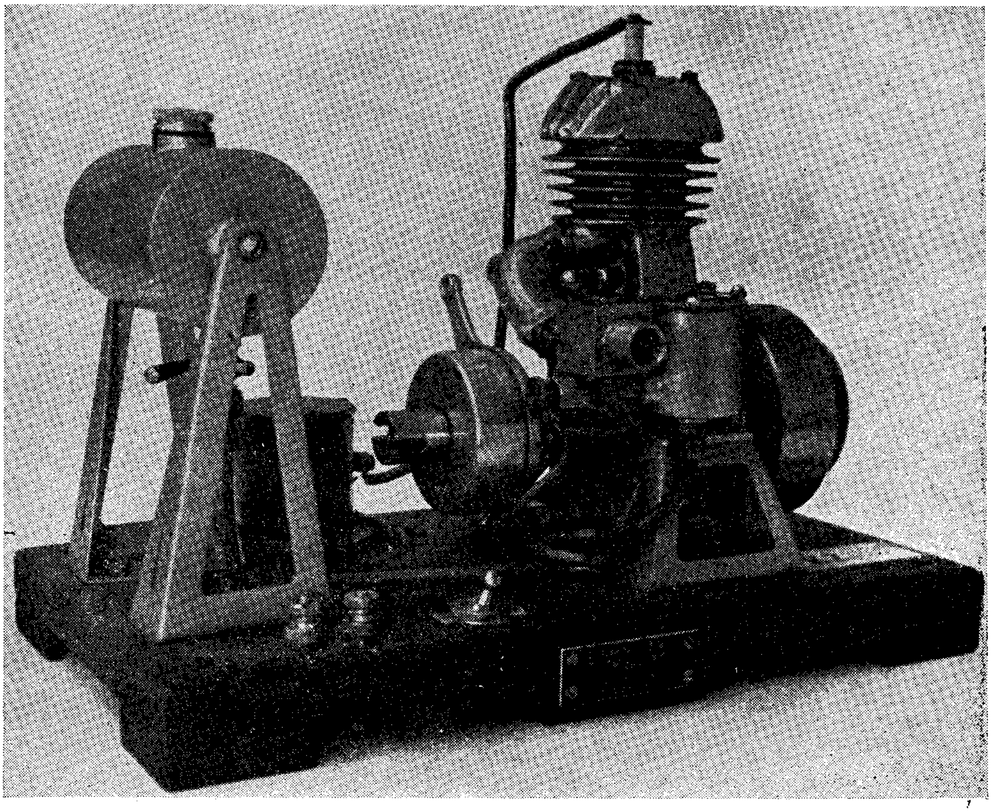
Other multi-cylinder en-

dynamic balance, and the facility for driving twin shafts, is a sufficient justification for the added complication which it entails. As most readers are no doubt aware, the two-stroke "split single" has for its main object improved scavenging and reduced loss of the fresh charge, besides making it possible, if desired, to supercharge the engine without complicating its valve or port arrangement. This, however, is a digression, and has no bearing upon the engine now under discussion.

A considerable amount of thought has been devoted to the details and auxiliary mechanism, which include a lubricating pump of the gearwheel type, located in the sump, and driven by a vertical worm-geared shaft. An eccentric at the upper end of this shaft operates a diaphragm pump delivering fuel to a distributor box over the cylinder-head, and thence by separate pipes to small reservoirs on three individual carburettors. Excess fuel overflows by way of a spill pipe, and is returned to the tank, thereby maintaining a constant level in the jet



Mr. A. B. Scorgie's "Busy Bee" engine



Mr. S. E. Hutson's **15 c.c.** *"Phoenix" engine*

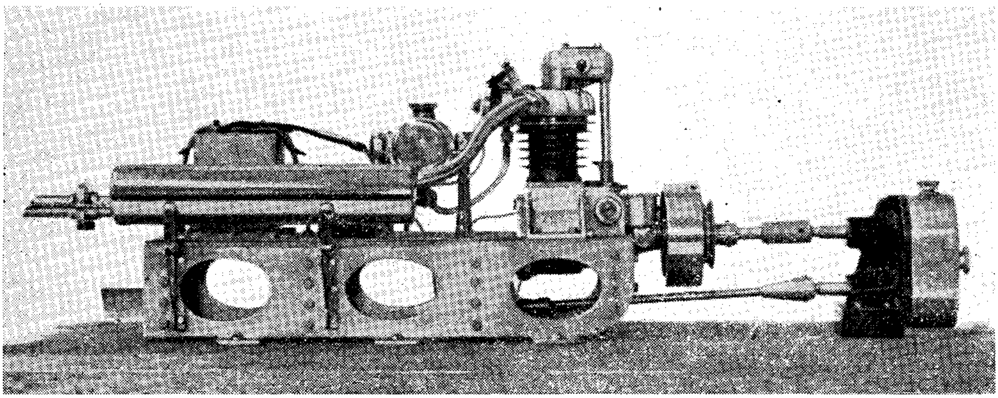
gines included an unfinished "Seal" 15 c.c. four-cylinder engine by Mr. G. Fletcher, of Colne, Lancs. It was shown dismantled, and the component parts bear evidence of excellent workmanship and finish. Both the camshaft and the four cylinder bores are very highly finished, and the other parts are also practically beyond reproach. One slight deviation from the original design is seen in the connecting-rods, which are of circular section, being thus somewhat simpler to machine, and it is possible that they will serve their purpose just as well in practice, though their appearance is not in keeping with general practice for an engine of this type.

The 30 c.c. twin-cylinder "1831" type engine by Mr. A. Brookes, of Warrington, also appears to be a thoroughly workmanlike job, and it is understood that this engine has proved very successful in actual working. It was shown complete on a testing stand, and an addition to the design, as published, is a tubular type radiator, also well designed and constructed. The general features of the engine appear to follow the original design closely in other main essentials.

Three very small two-stroke engines by Mr. L. R. E. Beale, of London, N.W.3, are chiefly noteworthy for their success in relation to their very diminutive sizes and capacity. They will all start quite readily by spinning the shafts with the thumb and finger, and so dispense entirely with any other starting gear. In the larger engine, a $\frac{1}{4}$ in. standard sparking-plug is employed, but the smaller engines have their plugs built into the cylinder-heads. It is rather interesting to note that these engines were built with the aid of a small lathe and other tool equipment, which were also entered by the same exhibitor in the tool section of the exhibition.

An example of the "Busy Bee" 50 c.c. auxiliary engine was entered by Mr. A. B. Scorgie of Aberdeen. This appears to be a fairly workmanlike example, following the published design fairly closely, and it also includes the carburettor and control lever, the details of which were published quite recently, so that no time can have been lost in producing them.

The Phoenix 15 c.c. two-stroke engine, by Mr. S. E. Hutson, of Bexley, also follows the published design quite closely, and is well made and finished. Another engine of the same type was seen in the Junior section, built by V. Ham, of West Worthing, and while the workmanship and finish of this is open to some slight criticism, it must be regarded as a very fine effort for such a young competitor. Of the individually-designed engines, the 15 c.c. o.h.v. high-speed engine, by E. E. U. Rogers, of Weybridge, was perhaps the most interesting. A good deal of care has been



A neatly-arranged marine power plant by Mr. A. R. Falconer

taken with the detail work, and the finning of the cylinder head is better than on many of these engines which have been seen in the past, but there are several details which appear to be somewhat out of proportion to the general design, and which might possibly have effect on the working efficiency of the engine. A carburettor of the "mousetrap" type is fitted, with Bowden cable controls from levers mounted on the frame, and there is also a control to the contact-breaker but the levers might have been of neater design and better arranged. However, it is somewhat unusual to see any provision at all made for controlling engines of this type.

A 3.2 c.c. compression engine, which was stated as being "intended for bench running" was entered by Mr. N. Whitefield, of Wishaw; this is a very good example of the somewhat austere design now apparently accepted as orthodox in this class of engine, and the workmanship, or as much of it as could be seen, was very sound. In view of the fact that it is stated as being intended for bench running, however, one would expect that some provision would have been made for fitting either an open or enclosed cooling fan, particularly in view of the fact that the cooling fins on the cylinder are square-cut, and would, therefore, be less efficient than properly tapered fins in performing their allotted function.

A very workmanlike marine power plant, including a 10 c.c. o.h.v. engine of the "C.I. Special" type, was exhibited by Mr. A. R. Falconer, of London, S.E.4. The engine, together with its tank and ignition equipment, is mounted on a raised platform, and the drive shaft, coupled to the engine, is taken to a gearbox, from which a return shaft is taken back under the engine. A plant of this type offers practical advantages in certain types of model power craft, by enabling the engine to be fitted well aft, thus providing extra latitude for adjusting the trim of the hull. It may be observed that the contructor is well known as one of the most active of the younger members of the model power boat fraternity, who has had a good deal of experience in model power boat construction and running.

(To be continued)

THE MARINE SECTION

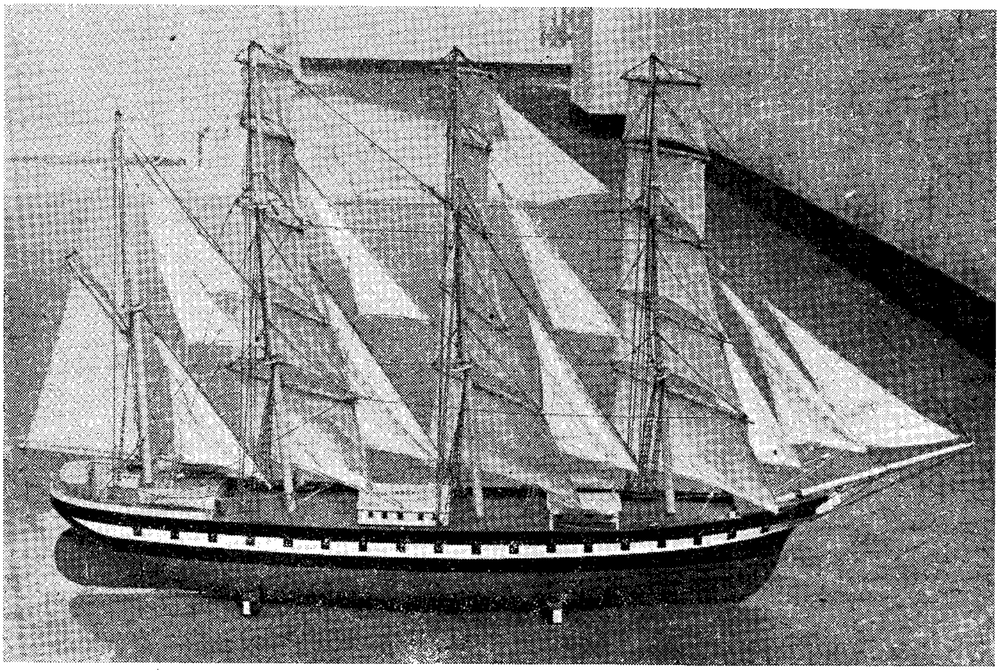
by Edward Bowness, A.Inst.N.A.

THE general opinion of all who visited this year's "M.E." Exhibition was that it was the "best ever." The standard of craftsmanship was definitely higher this year than in previous years, and the wide range of interests represented, shows that model engineering and model making generally is being taken up by more and more people of all ages and from all walks of life. This improved standard was very noticeable in the maritime section: there were a number of superb examples of ship modelling, especially amongst the sailing ships. The historical ships were particularly good and gave evidence of careful research work, more especially in the rigging. The increasing use of boxwood and other hard woods is a very pleasing sign of the times, although we find it difficult to make up our minds as to whether the tendency to leave the wood in its natural colour is on the whole a good one. Most ships were painted, if not completely, at least to some extent, and to paint the model in its proper colours is more accurate and more realistic. However, the other method shows up the work of the craftsman, and he may be excused for not wishing to conceal it by paint. But on the whole we consider that if proper care is taken to reproduce the appearance of a ship of from, say, the Elizabethan period to Nelson's time, little or nothing of the craftsmanship need be concealed. From the main wale up to the freize, the wood was treated only with oil, and thus was left in almost its natural colour. The main wale, which was black, could be stained or even blackened with shoe polish, well rubbed in. Below the wale, if the planks are not shown, the frames will, of course, be left in their natural colour. Stain can

be used in many cases, and where paint is essential it must be applied as thinly as possible.

In some of the models the rigging was spoilt by the use of unsuitable cord and in a few cases the variation in thickness of the ropes was not sufficiently appreciated. The Cup-winning models, Mr. F. A. Pariser's ship-rigged sloop *Echo*, and Mr. C. J. Clarke's *Endeavour Bark* were beautiful examples of craftsmanship, although both lost a few points with little slips in rigging. The Severn Trow *Alma* by Mr. A. E. Field, last year's Championship Cup winner, was a very fine model of an interesting type. We were interested to see Lt.-Cdr. T. F. Richard's nicely detailed model of H.M.S. *Implacable*. This old ship, which came to such a sad end, was worthy of more attention from ship modellers. True, she was not British built, but she was a fine example of the old 74's, which constituted the mainstay of the navies of the Nelson period. In this particular model we noticed the closed-in fo'c'sle head. Although in her later days she had this feature, we feel sure that originally she had the beakhead bulkhead. The model of the *Sea Witch*, by D. D. Bilimaria, of Bombay, was strikingly American, both in its hull with the transom stern, and the excessive flare at the bows, and in the tall, tapering spars and delicate rigging.

We were pleased to see that the section for Working Models of Yachts and Sailing Ships was quite large this year, and contained some good models. The two 4-m barques *Flying Cloud* by A. K. Williams, and *Archibald Russell* by P. Blanchot, were an interesting pair. The hull form of the latter was not very good and had far too much flare at the bows, but the sails were very neat and the rigging quite realistic. But for practical sailing we consider that Mr. Williams's simplified rigging is much the better scheme. The 3-m barque *Lady Irene* by Mr. A. J. Lench, and the 3-m barquentine *Ocean Queen* by Mr. F. Pearson were both at the Hove Regatta in July, and represent very practical examples of their type. Two of the racing yachts were fine examples of their type the 10-rater by Mr. W. C. Morrison being a superb example of planking in mahogany. This we consider is an instance where paint should *not* be used, especially as one does see a number of full sized yachts finished in varnish only. The bread-and-butter hull in Mr. C. V. Hooper's Marblehead *Delia* had an interesting feature in its ¼ in. layer of mahogany, interposed between two of the obechi layers to form a boot topping. This model was varnished and not painted. We welcome the tendency amongst yachtsmen to compete in improving the appearance of their models as well as in racing them. Mr. E. Sabin's 2 in. scale model of his weekend cruiser—his dream ship—was much admired, as was also Mr. C. Knapp's model of a cruising yacht to ⅝ in. scale.

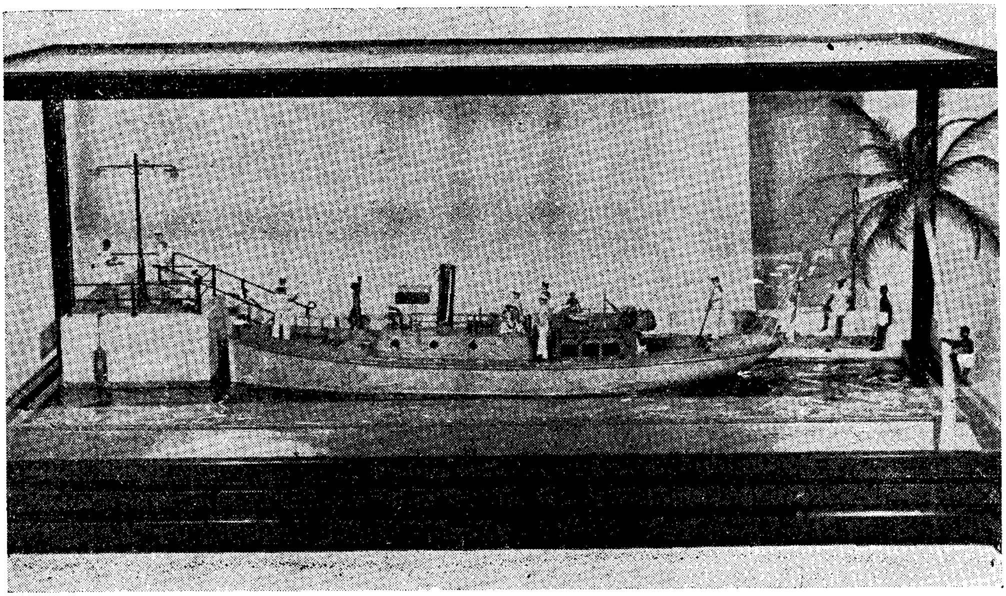


Mr. K. Williams's sailing model barque—scale 1/5 in. = 1 ft. Note simplified rigging

The outstanding model in Class "D"—Steam and Motor Ships—was undoubtedly the Cup winner, Mr. C. A. Chapman's model of the Admiral's Barge. These little ships were very attractive as a type, with their smart, well-kept

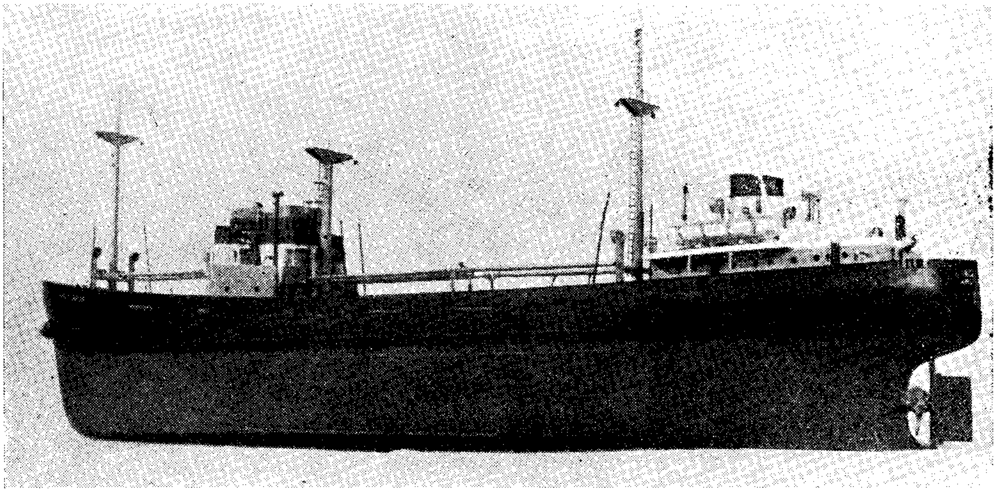
appearance and polished brass work, and the model displayed the type to perfection. The model itself looked equally well, whether in or out of its sea, as the underwater body with its rudder and propeller was finished to the same standard as its upper works. But the setting made a perfect finish to a perfect model. The figures, both naval and native, were beautifully modelled and the attitudes were most natural in every case. The waterline model of M.V. *Caledonian Coast* by Mr. E. N. Taylor, was a very fine piece of work, as was also Mr. C. Yeates's model of R.M.M.V *Hibernia*. Mr. Taylor's model had the less attractive prototype, but was made as the result of a voyage he and his wife made in her as their summer holiday. Probably this inspired Mrs. Taylor to take up modelling, as shown in her model of the *Flying Enterprise*. May they be as successful as that other well-known pair of modellers, Mr. and Mrs. McNarry! The Working Steamers—Class "E"—were a little award. A close contender for the cup was Mr. G. A. Nurthen's radio-controlled cabin cruiser *Ione*. This had an i.c. two-cylinder engine of his own design and a very well laid-out engine compartment, not to mention its elaborate radio control installation. The electrically-driven model cargo steamer *Lingestroom* by R. C. Jackson, which won the Lewis prize for the best prototype, was a very pleasing model of this type of ship. The sweep of the long sheerline, and the impressiveness which always goes with the tanker-type layout, with the funnel and the accommodation well aft, showed up very well, and the semi-matt finish was very appropriate.

The miniatures formed an important and a very interesting section which included some very fine work, fine both in the sense of being intricate and also in being of first-class quality. The old hands, McNarry, Draper, Carpenter, Shipsides and Bowen, were all there, and a



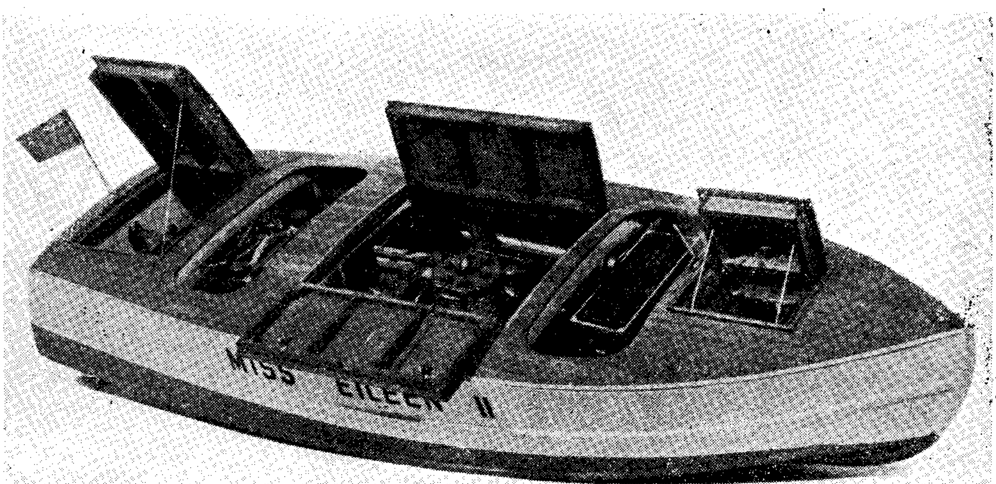
Mr. C. A. Chapman's scenic model of the Admiral's barge. Winner of the Steamer Championship Cup

disappointing from the ship modeller's point of view. It is perhaps too much to expect that a modeller should be expert in hull building and in making a power plant, and also, in many cases, a radio control installation. Even in sailing ships the hull is often inferior to the rigging and vice versa. Some of the models were rather lacking in deck details, and there were occasionally signs of "scale scattiness," to borrow Jason's expressive word. In one case the difference between the spacing of the steps on the accommodation ladder, and on those up to the fore deck was rather striking. The winner of the Willis cup, J. W. Sullivan, with his petrol-driven radio-controlled model of *Miss Eileen II*, showed a beautifully built hull with lovely lines, and well deserved his number of newcomers made a welcome appearance. Mr. McNarry's 40-gun frigate was a marvel of rigging in miniature, and his guns and hull detail were as good as his rigging. Of a totally different type was his model of the modern steam trawler *Thorina*. This is one of the daintiest miniatures we have ever seen, and the sea setting was very well done. Mrs. McNarry's model was one of the early Clyde paddle steam boat *Comet*. The hull form was very nicely modelled and the details of the engine, boiler and gears were very good. Miniature modelling seems to be becoming popular with the ladies, no less than four sending in models, all of which were to a very high standard. Miss D. Kimber sent in a nice model of an 18th century Revenue cutter, and Mrs. V. Montagu-Fergusson a model



Working model cargo steamer by Mr. R. C. Jackson, awarded the Lewis Prize for realism

of a Greek caique, in a very nice setting showing the temple of Poseidon on a high cliff. Mrs. M. D. Chambers entered a model of the famous 4-m barque *Wanderer*. The sea in this model was very realistic, and was further enhanced by a painted background. The whole effect was very sunny and breezy. This model was awarded the special Hampshire prize for its good scenic appearance. Mr. G. H. Draper's models of Royal Naval open boats to ¼ in. scale, were a notable collection. The modelling was perfect from every point of view, the run of the planks in the clinker built boats being particularly clean. The gratings and internal fittings were also exceptionally good. Mr. R. Carpenter sent two beautiful miniatures, a waterline model of S.S. *Arakaka* and one of the S.Y. *Shemara*. The clean, neat detail work was of a very high standard. There were two nice models of barges, and in each case they were on the mud, one, of the spritsail barge *Kathleen* by Mr. F. W. Shipsides, and the other, the ketch barge *Martinet* by Mr. A. S. Randall, discharging coal alongside a wharf. In each case the atmosphere was well conveyed. Mr. J. L. Bowen's model of the M.S. *English Star* was a delightful piece of work. It was to his usual scale of 1 in. = 100 ft., and was one of the very few models to this scale. The tendency seems to be towards using a larger scale, and there is much to be said for it. So



Mr. J. W. Sullivan's radio-controlled speedboat, winner of the Willis Cup

much more detail can be shown, and it can be just as minute and intricate as that in the smaller scale model. There were many more good models, to which we could refer, but space forbids. In these days of small houses, and limited materials, the miniature is a pleasant solution of the problem and this type of model will, no doubt, become even more popular as time goes on. We are hoping to provide a special cup for this section next year.

There was a welcome improvement in the quality of the cases this year, some being particularly good. This applies equally to the cases for miniatures as to those of larger models.

"The Model Engineer" Exhibition Prize Winners

Locomotive Championship Cup
L. R. Raper, of Wakefield. 3½ in. gauge, ¾ in. to 1 ft. scale, 0-6-0ST contractor's type locomotive.

Steamship Championship Cup
C. A. Chapman, of Peacehaven. 5/16 in. scale model of the Admiral's Barge.

Sailing Ship Championship Cup
F. A. Pariser, of Birmingham. ¼ in. scale model of the sloop *Echo*, 1782.

General Engineering Championship Cup
A. W. Tucker, of Bramhall. 3 in. scale surface condensing launch engine (*c.* 1913).

Aircraft Championship Cup
T. S. Nachtman, of Harrow. 7 ft. wing span radio-controlled sailplane of free-lance design.

Club Team Cup
Birmingham Ship Model Society.

The "M.E." Ship Model Societies Challenge Trophy
Birmingham Ship Model Society.

The Bradbury-Winter Memorial Challenge Cup
C. B. Reeve, of Hastings. Eight-day chiming, striking and musical long case clock.

The Maze Challenge Cup
C. J. Clarke, of West Bromwich. 1/60 scale model of barque, *Endeavour*.

The Willis Challenge Cup
J. W. Sullivan, of London, S.W.8. Free-lance radio-controlled speedboat.

The Model Aircraft Trade Association Challenge Cup
A. Roginsky, of London, N.16. *Flying Minutes*. Rubber-driven Wakefield type model.

The "Bristol" Challenge Cup
B. V. Manders, of Enfield. Bristol M.I.C. 1/9th scale free-flight model of the 1914-18 war aircraft.

Silver Medals
G. and P. Wheeler, of London, W.14. 5 in. gauge; 1 in. to 1 ft. scale; 4-6-4T Halton type locomotive.
E. N. Taylor, of Gosport. Waterline model of M.V. *Caledonian Coast*.
C. Yeates, of Nottingham. Waterline model of R.M.M.V. *Hibernia*.
G. A. Nurthen, of London, N.W.6. ½ in. scale radio-controlled cabin cruiser.
A. E. Field, of Walsall. ¼ in. scale model of a Severn trow.
D. C. Wray, of Edgware. Spritsail barge, *Kathleen*.
W. C. Morrison, of Southall. 10-rater model racing yacht.
D. McNarry, of Barton-on-Sea. Waterline model of a 40-gun frigate (*c.* 1790).
G. H. Draper, of Ilford. Group of Royal Naval open boats; ¼ in. scale; various periods.
G. C. Taylor, of Earley. 1½ in. scale Fowler showman's engine slightly modified.
A. J. Kent, of Smethwick. 1 in. scale Ransomes 6 n.h.p. showman's engine.
C. B. Reeve, of Hastings. Eight-day chiming, striking and musical long case clock.
H. A. J. Smith, of Bexleyheath. 4 in. to 1 ft. scale fully working overstrung piano.
M/Sgt. C. H. Crowe, Jnr., of Ruislip. Class "B" team racer control-line aircraft.
R. Livermore, of Bromley. Non-flying scale model of the D.H. *Mosquito* Mk. VI F.B.

Bronze Medals
C. J. Hainge, of Oxford. 3½-in. gauge; ¾ in. to 1 ft. scale; 0-6-0T L.M.S.R. Class "3F" locomotive.
R. J. B. King, of Strood. 18 mm. gauge; 4 mm. to 1 ft. scale; 4-2-2 Midland Railway locomotive, *Princess of Wales*.
H. Macklin, of Dovercourt. 3 mm. scale model of H.M.S. *Cossack*.
C. T. Seller, of Ruislip. ½ in. scale model private yacht, *Fairy Flax*.
F. L. Willbourn, of London, N.W.6. ½ in. scale model 70 ft. cabin cruiser.
M. J. Glandfield, of Richmond. ¼ in. scale model of barge, *Will Everard*.
E. Glew, of Birmingham. 3/64 in. scale model of the ship *Archibald Russell*.

G. Swarts, of Barry. ½ in. scale model of Barry Dock lifeboat.

R. E. Brunsdon, of Reading. $\frac{1}{16}$ in. scale model of the ship *Archibald Russell.*

G. C. Matthews, of Berkhamstead. 1 in. scale model of a cruising yacht.

E. Sabin, of Seaford. 2 in. scale model of a "week-end" cruiser.

C. V. Hooper, of London, S.W.11. "Marblehead" racing yacht *Delia.*

W. E. Bint, of Oxford. 1½ in. scale model of racing eight.

J. F. Lewis, of Brockenhurst. ½ in. scale Bristol air/sea rescue launch.

R. A. Phillips, of London, S.E.21. Racing hydroplane, *Foz* 2.

R. Carpenter, of Brighton. Waterline model of Booker Line S.S. *Arakaka.*

R. Carpenter, of Brighton. Scenic model of Sir Bernard Docker's S.Y. *Shemara.*

A. S. Randall, of London, S.E.20. Scenic model of ketch barge *Martinet* discharging coal.

D. McNarry, of Barton-on-Sea. Waterline model of motor trawler *Thorina.*

F. L. Folkard, of London, E.11. 1½ in. scale model of Matthew Murray's hypocycloidal engine.

A. L. G. Newman, of Oxford. 1½ in. scale Burrell traction engine.

J. E. Brooks, of South Benfleet. 1 in. to 20 ft. scale model of Barking Abbey in A.D. 1500.

C. C. Clarke, of Welwyn Garden City. Electronic organ built on the "Hammond" principle.

J. W. Thomas, of Whitchurch. Half-scale models of a pair of duelling pistols (*c.* 1820).

B. Lyons, of Hove. Collection of hand and machine tools.

D. A. Ridley, of Southall. Lightweight rubber-driven model.

B. A. Skinner, of Ruislip. Control-line speed aircraft with 10 c.c. engine.

W. R. Stobart, of Northampton. *Unicorn.* 12 ft. wing span sailplane.

P. G. Cooksley, of Beddington. 1/24th Hawker *Fury* non-flying model.

R. Hutchings, of Beckenham. Fully detailed free-flight flying scale model of the Sopwith *Camel* type IFI powered by a 2 c.c. diesel engine.

L. Halko, of London, W.2. 90 in. wing span radio-controlled sailplane. Free-lance design.

Diplomas

Very Highly Commended—49 awards.

Highly Commended—57 awards.

Commended—57 awards.

SPECIAL PRIZES

The Surrey Hills Live Steamers of Victoria, Australia, Prize

J. I. Austen-Walton, of Worthing. 5 in. gauge; 1 in. to 1 ft. scale; 0-6-0T L.M.S.R. Class "2F" locomotive. The original "Twin Sister" locomotive.

The Wing-Commander J. F. Lewis Prize

R. C. Jackson, of Wood Green. Electrically-driven model cargo boat.

The Messrs. A. J. Reeves & Co. Prize

J. W. Moon, of Middlesbrough. 3½-in. gauge; ¾ in. to 1 ft. scale; 0-2-2 "Rocket" type locomotive *Rainhill.*

The New York Society of Model Engineers Inc. Prize

A. T. Freeman, of London, S.W.19. Steam-driven model passenger cruiser.

The Hampshire Prize

Mrs. M. D. Chambers, of Rugby. Waterline model of the four-mast barque *Wanderer.*

The Ferguson Prize

G. Brook, of Brighouse. An example of the "M.E." beam engine.

The Stephen H. Clarke Prize

C. F. Cox, of Swindon. Stuart Turner No. 9 engine fitted with governors and pump.

The Bradbrook Prize

C. J. Hainge, of Oxford. 3½-in. gauge; ¾ in. to 1 ft. scale; 0-6-0T L.M.S.R. Class "3F" locomotive.

The John V. Muller Memorial Prize

I. J. Swain, of Sanderstead. 4 mm. scale country milk-collecting depot.

The W. K. Waugh Prizes

Set of castings for "Britannia"

L. R. Raper, of Wakefield. 3½-in. gauge; ¾ in. to 1 ft. scale; 0-6-0ST contractor's type locomotive.

Set of castings for "Invicta"

Dudley H. Harris, of West Wickham. 3½-in. gauge; ¾ in. to 1 ft. scale; London & North Western Railway locomotive *Crewe.*

The "Model Railway News" Prizes

First Prize.—R. J. B. King, of Strood. 18 mm. gauge; 4 mm. to 1 ft. scale; 4-2-2 Midland Railway locomotive, *Princess of Wales.*

Second Prize.—A. J. Powell, of Burton-on-Trent. 7 mm. scale free-lance 25-ton narrow gauge hopper wagon and narrow gauge coach.

Third Prize.—A. L. P. Green, of Malvern. 4 mm. scale 4-6-0 G.W.R. "King" class locomotive, *King George VI.*

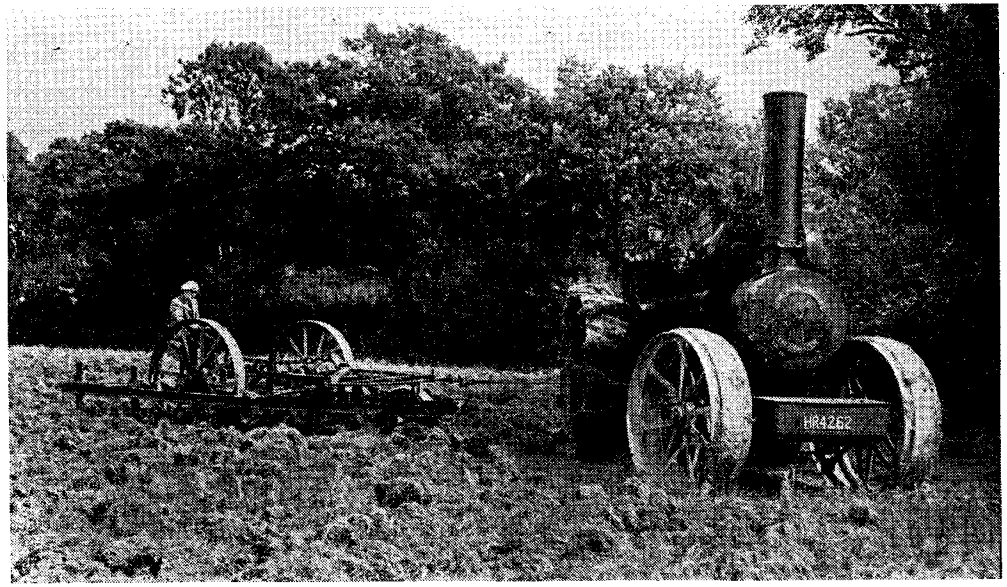
The "Model Ships and Power Boats" Prize

E. Glew, of Birmingham. 3/64 in. scale model of the ship *Archibald Russell.*

The "Model Aircraft" Prize

Miss Patricia Healy, of Leigh-on-Sea. *Haltonian.* 34 in. wing span glider.

STEAM PLOUGHING



WE are indebted to Mr. G. G. Garland, of Petworth, Sussex, for the photograph reproduced herewith. In spite of the fact that the steam road locomotive is now all but obsolete, there are still some jobs for which steam is superior to other forms of power ; or, perhaps, we should put the matter in a more correct light if we said that steam is, even now, a more convenient source of power in certain circumstances.

Steam ploughing is still used, if but rarely, in various parts of the country ; some farmers who still possess steam ploughing engines, and have kept them in good working order, find that they are the best possible means of ploughing up hard ground which has been lying derelict for some time ; other farm implements cannot cope with such work so expeditiously. We have only to recall the terrific manual labour that was necessary in the days before the steam plough came into use. After that, horse ploughs were, of course, applied to it ; but, later, it was the steam plough that solved the problem of getting the work done in quicker time, and where engines and tackle are available, it can hold its own against newcomers.

In the picture, which was taken recently in the Five Oaks district, near Horsham, Sussex, hard ground is being broken up by steam power in preparation for winter wheat. The engine is a typical Fowler, and we would not be surprised to learn that she is one of the pair referred to in our issue of September 11th, by the Southern Region railway engineman, Mr. D. Greenwood, of Horsham, and more recently by Dr. J. L. Middlemiss.

Institute of Marine Engineers Examinations

We have been advised that the next examinations for admission to the Institute of Marine Engineers will be held as follow :

Students (Common Preliminary Examination), April 14th to 17th and October 6th to 9th, 1953.

Graduates (Sections A and B of Associate Membership Examination), April 27th to May 20th, 1953.

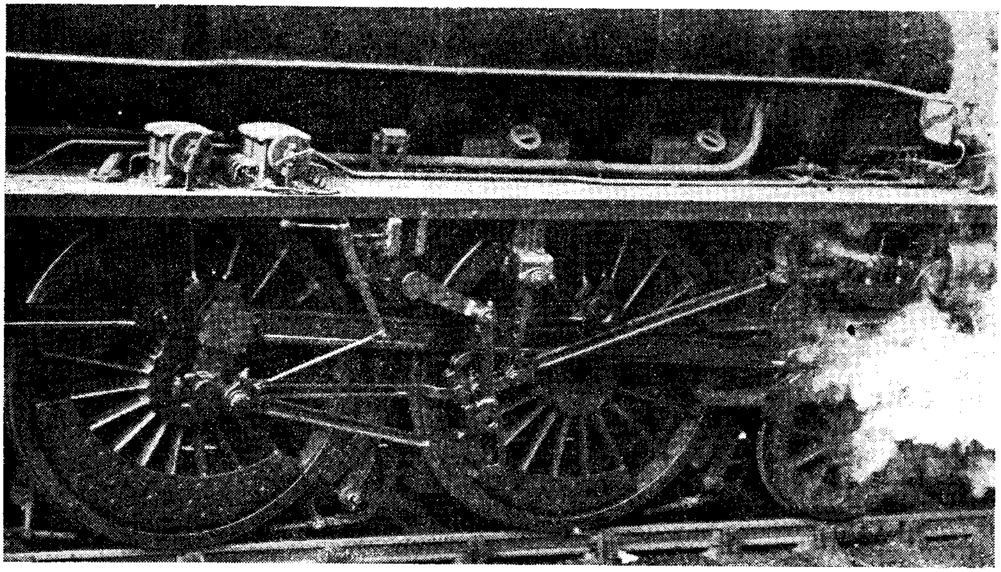
Associate Members, April 27th to May 21st, 1953.

Syllabuses of these examinations, and particulars of exempting qualifications will be supplied on application to the Secretary, 85, Minories, London, E.C.3.

"L.B.S.C.'s" Lobby Chat

Outside Stephenson Link Motion

A FEW weeks ago, when commenting on a correspondent's query about the outside Stephenson link motion on the old French Crampton engines, I promised to return to the subject, and deal with the matter more fully, when opportunity arose. My reference to the L.M.S. Class 5 engine which was experimentally fitted with outside Stephenson link motion, brought a response from a Manchester reader, Mr. A. Bendell, who kindly forwarded the reproduced close-up photographs of the whole issue, for which many thanks indeed. They show the whole arrangement very clearly. Our worthy friend says that at the time the photographs were taken, the engine was regularly working the 12.30 p.m. stopping train from Liverpool (Exchange) to Bradford, returning on the 5.8 p.m. Bradford-Liverpool express. The regular drivers all spoke very highly of it, preferring it to any others of the same class, chiefly owing to its free running, but most of all for its hill-climbing abilities. This particular route has some pretty stiff gradients on it, and the trains are all limited load, but neither load nor grade seems to worry the engine overmuch; she just "takes 'em there and brings 'em back" as a mere routine job.



Link motion on L.M.S. Class 5 locomotive

Related to Swindon

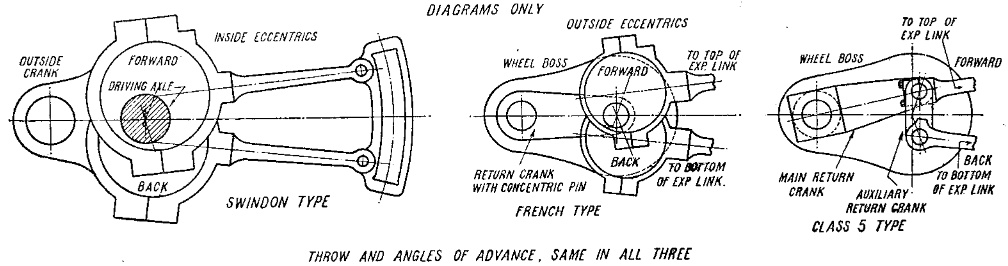
The coming of the Stanier regime to Crewe saw the wholesale introduction of Swindon practice to the L.M.S.—the directors called it "the Churchward touch"—and the aftermath of this can be seen in the valve gear illustrated, for it is virtually the "works" of a G.W.R. two-cylinder engine, such as the "Saint," "Hall" or "County" classes, transferred to the outside of the frame, and driven by a double return crank instead of the usual eccentrics. In the latter respect, it is "one up" on the kind used on the French Cramptons and other engines, which still employed eccentrics, albeit they were only little ones mounted on a small centrally-disposed return crankpin. The Class 5 engine (*Stephanie* would be a very appropriate name for her !) has the Swindon type of launch links; but these being located outside the wheels, and away from the frames, double lifting links are necessary. Naturally, the inner link prevents the die block being carried direct by a suspension lever, as it is on the inside motion, so a little jerrywangling is called for. The old familiar inclined valve-coupling-rod, a feature of the Swindon gear, is all-present-and-correct-sergeant, and is hung in a manner somewhat similar to the G.W.R. engines, by a pendulum lever at each end. The forward one is also connected direct to the valve crosshead by a short rod, as the motion doesn't have to be transmitted from inside to outside of frame. The upper end of the rear pendulum lever swings on a pin in a decidedly "Bill Massive" type of bracket attached to the frames. The rear end of the inclined rod is forked, the fork being long enough to accommodate the lower end of the pendulum lever, which supports it; the die block is carried at the extreme end of

the fork, which embraces the expansion link and is clear of the lifting links. The latter are raised and lowered by arms on the end of a weighbar shaft of the usual pattern, located between the leading and driving wheels.

The drive is arranged very simply. A return crank, similar to that used for Walschaerts gear, is mounted on the end of the main crankpin, and the return crankpin is offset to the amount needed to rock the link just right for forward gear. To actuate the back gear eccentric rod, a weeny return crank is mounted on the pin of the larger one—reminds me of the old schoolboy jingle commencing "Big fleas have little fleas upon their backs to bite 'em"—and the pin of the baby one is offset to the right position for back gear working. The positions are shown in the reproduced diagrams, from which any tyro or novice can see that the centres are the same, both on the big eccentrics and the return cranks, so that the movement given to the expansion link is also the same. The different way of transmitting it, is merely a matter of convenience in arranging the drive. The forked ends of the eccentric rods are attached to the link in the usual manner, but the driving ends of the eccentric rods are suited to the return crankpins. The outer one, for backward gear, is the same as would be fitted to the eccentric rod of a Baker or Walschaerts gear, viz. just a plain bush pressed into a boss formed on the end of the rod. Incidentally, this boss has a lug on it, to which is attached a rod for driving the ratchet levers of the mechanical lubricators, which are coupled by another rod. The back gear crank obviously prevents a plain bushed bearing being fitted to the fore-gear crankpin, so the fore-gear eccentric rod is furnished with a little big-end (says Pat) of the marine pattern, with split brasses secured by two bolts. The loose half has an oil cup on it.

The whole bag of tricks is neat and effective, and could easily be adapted to a *Doris*, or any similar 4-6-0; or even a Pacific, for that matter. The whole of the rods could be made from mild steel, and the brackets for the pendulum levers built up by brazing pieces together, or cut from the solid as preferred. If sufficient builders were interested, I would gladly make a detailed drawing of the whole layout, suitable for *Doris* or any other engine with the same wheelbase. It could be adapted for other lengths of wheelbase, by altering the lengths of the eccentric rods, and making the curve of the expansion links to suit.

There is just one point over which any inexperienced worker would have to be careful; and that is, the setting of the return crankpins. With an ordinary Stephenson link motion inside the frames, having the usual eccentrics on the axle, the eccentrics can be adjusted. Not so the return crankpins; once set, "they're there" as the saying goes. If you try to shift them, it alters the throw, and the angle of advance as well. However, it isn't a difficult matter to set them correctly; much easier, in fact, than turning a driving axle with four eccentrics, from the solid. If I made drawings, our advertisers would most likely supply castings for the pendulum lever brackets and weighbar shaft bearings.



Inside and outside link motions compared

Cast Parts for Baker Valve Gear

Whilst on the subject of valve gears, here is an item of news which may be of interest to those readers whose time is very limited, and also those who are not particularly in love with carving little valve gear parts from mild steel. I have an experimental job in hand (of which, more anon) and propose fitting Baker valve gear to it; and in the course of a letter to friend Reeves of "Baernegum," said that I wished to goodness the Baker firm in U.S.A. supplied pressings and stampings for little Baker valve gears as well as full-sized ones, as it would save a dickens of a lot of time. Well, my wish has come true; for a couple of days ago, time of writing, I received a small parcel containing two complete sets of parts for Baker valve gear, only they didn't come from U.S.A., but from "Bro. Reevesco." The gear frames are cast in bronze, and are beaded, same as the full-sized frames. The bell-cranks, gear connecting-rods, reverse yokes and other parts are in malleable iron. The whole bag of tricks can be fitted up in a fraction of the time it takes to cut out the parts from solid mild steel, and (this will tickle Inspector Meticulous) the appearance is the same as the full-sized article, the parts of which are not polished up, but left just as they come from the presses, a dull "iron" finish.

Bracket-type frames are supplied, but the girder type will be forthcoming. I checked off the dimensions of the various parts, and they are the same as I have specified for *P. V. Baker*, *Juliet No.* 2, and similar jobs. If all goes well, I shall have a set fixed up by the time these notes are in print, and hereby pass a vote of thanks to our worthy friend mentioned above, for saving some of my precious time.

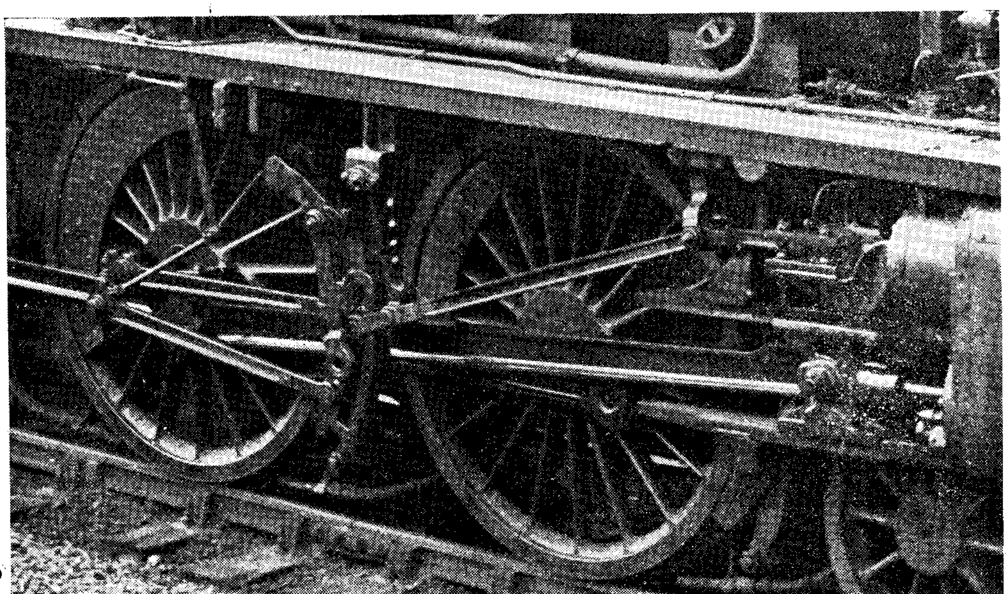
Always Room for Improvement !

I guess most readers are familiar with the advertisement featuring a little girl who thought her dress was white, until another one came along wearing a frock that had been washed with somebody's patent soap powder, and bobby-dazzled so much that poor No. 1 thought hers had suddenly turned grey. Well, similar things happen in the world of little locomotives—and big ones, too, for that matter ! I know of many locomotive-builders who thought their engines the cat's whiskers, until they met one a wee bit more efficient. A case in point occurred just recently, on my own line. For quite a number of years, I had been in correspondence with a Lancashire reader who had built locomotives to "words and music," and was satisfied with their performance. He got in trouble with an injector ; persevered with it, but had no luck, and as I have a knack of reading "between the lines" of most letters received, I offered to put it right for him. When it arrived, I saw that the cones were not right, so fitted a new set, and tested the injector O.K. for two miles on old *Ayesha* ; but I used my own clack, with, of course, *Ayesha's* pipe and steam valve. The injector went back, and was refitted on the owner's engine, but he wrote to tell me the water still went on the ground, and not in the boiler. I knew the injector itself was O.K., so I asked him to return it, with his clack and pipes, as I suspected that the trouble was in the installation. It was ; his clack was defective, so I put it right, and after another two-mile test, returned the lot.

In due course, I received another letter saying the injector now fed the boiler, but was tricky to operate. Although I don't entertain strangers—too old and crotchety nowadays !—I had corresponded with him a long time, and I hate to refuse a helping hand, so I offered to give him a demonstration if he could call some time by appointment. As it happened, he was visiting the Commercial Motor Exhibition at Earls Court, so I soon made a date with him. He duly arrived, and I steamed up one of my engines for him, showing him how I operated the injector, so that pressure was fully maintained, both running or standing. The engine has injector feed only ; no pump. He took over, and ran the engine a mile or so, operating the injector on the run, without any trouble ; but when he stopped, he said that it wasn't the injector that astonished him, but the tiny thin fire on which the engine maintained a full head of steam, and pulled her load, blowing off nearly all the time. He said his engine went all right, but needed a fire big enough to roast an ox, and seldom blew off ; and added that when he got back, the first thing would be, to have the cylinders and valve gear all down, and see if he could reduce the steam consumption to something approaching that of my own engine. I gave him a few "'ints and tipses," and hope to hear in due course that his engine has ceased to emulate a Southern spam can, as far as coal consumption is concerned.

Big v. Little Boilers

One subject leading to another, brings to mind that several readers have queried the ability of the smaller boiler I specified for *Tich* to supply enough steam for continuous running. It was really to satisfy the "doubting Thomas" fraternity, that I gave a larger boiler as alternative ; but the small boiler definitely *will* do the job,



Note link suspension and double return crank

provided that the workmanship on the cylinders and motion is reasonably good. Otherwise, I should never have specified it; it is no game of old Curly's to lead folk "up the garden," as I do my testing and experimenting on the track, not only on the drawing board, and so can fully guarantee results.

Proof of the above was given in a startling manner on a recent Saturday afternoon. We had a "Live Steamers' Meet" in miniature; one of the engines was a 3½-in. gauge G.W.R. "County" class 4-6-0, and there were two *Tich* jobs, one of which had the larger boiler and the other the smaller one. It is hardly necessary to say that the "County" performed in the manner usually observed among G.W.R. locomotives; in fact, the driver sheared the pins in the brake shaft of my driving car, endeavouring to stop her with a good load. Unfortunately, Jupiter Pluvius decided to take a hand in the game, just as the larger-boilered *Tich* got steam up; and although she batted around all right, and made plenty of steam, it was impossible to try her with a good load on the slippery rails, so we adjourned for a cup of the enginemen's best friend until the line dried up sufficiently to resume operations.

By the time the weather cleared up a bit, the day was drawing to a close, so the small-boilered *Tich* was steamed up, and she promptly proceeded to do the doings in no uncertain manner. I wish that the "unbelievers" could have seen her on their television sets—I wouldn't have them around my little railway for all the tea in China! First of all, her owner and builder took her around, or strictly speaking, she took him around, the tiny coat-button wheels spinning like a buzz-saw, the rods and valve gear a silvery blur, and the boiler making not only enough steam to pull the load, but a bit extra for luck, just to keep the old spring-balance busy. Then the owner of the G.W.R. "County" took over, and the tiny four-wheeler ditto-repeatoed her performance, sailing around the line at a tidy lick, with the safety-valve sizzling away most of the time. This amazed the builder of the larger-boilered *Tich*, who remarked "Why bother about the larger boiler, when the little one makes all the steam needed?"

For new readers' benefit, I might repeat here, that the main advantage of a larger boiler than absolutely necessary, is that it is more stable; for example, when operated by an inexperienced fireman. The greater bulk of water carried is less susceptible to firebox temperature fluctuation (two more like that and I'll be writing papers for the Institution of Locomotive Engineers!). In lobby lingo, if a ham-fisted knight of the shovel lets the fire burn low, bales in a load of black diamonds, and nearly smothers the live embers left on the bars, the larger quantity of water in the boiler will hold the heat better whilst the fire burns up again. Steam generation is governed by the temperature of the water; and if it doesn't cool off too quickly, the engine will keep going, and the blast will quickly pull up the fire sufficiently to provide enough "therms" to restore working temperature, and consequently pressure. Beginners and novices usually cherish the idea (like the "drawing-board designers" of days gone by) that steam generation depends directly upon the amount of heating surface; yet a fireless locomotive makes steam for hours *without any heating surface at all*!

Any boiler with correctly-proportioned heating surface, will steam continuously, irrespective (within reason, of course) of its size, and that is why the small *Tich* boiler does the job. There is no necessity, either, for a huge grate area, as long as it is right for the firebox. To demonstrate this, as a finale to the events mentioned above, I steamed up the little 2½-in. gauge L.N.W.R. 4-4-0, which has a grate only $\frac{15}{16}$ in. wide. It needed a bit of careful handling, to get away on the wet and slippery rails without any sand; but the little engine did it, and then proceeded to astonish the company assembled, by covering a mile at a speed equal to over two miles per minute in full size, blowing off skyhigh every time the firehole door was shut. It was too dark to see the water in the gauge, so I stopped when the tender was empty. She effectually settled any doubts as to the efficiency of a small boiler!

A Disastrous Fire

We learn, with much regret, of a very serious loss sustained by the Silver End and District Model Engineering Society. On a recent night, the large departmental store in which the society had its headquarters was destroyed by fire; as a consequence, the society lost the whole of the contents of its workshop, including several models on which members had been at work for about 3½ years.

The total loss comprises: two lathes, a grinder, a drilling machine, four benches, eight vices, a very comprehensive range of hand and precision tools, five locomotives in various stages of construction, two finished yachts, one barge, a very fine compound stationary engine of beautiful workmanship and detail by Mr. Ric Elmes, the cartoonist, and several model aeroplanes made by the junior members.

A disaster of this nature is always disheartening; but in this particular case it is all the more so, in view of the fact that the models on which the members had been working had not very long before, reached a stage that made them fit for exhibiting to the public and had, in fact, been so exhibited at the local horticultural show a month previously. The barge was a valuable one on loan to the society, and its loss is a serious blow to the owner.

Mr. G. J. Worship, acting hon. secretary of the Silver End M.E.S., states that the fire was so fierce that the remains of the workshop contents looked as if they had reached a molten stage. We know that readers will join us in offering sympathy to the unfortunate society, but we hope that the members have not entirely lost heart and that they will rally round in the endeavour to put the society on its feet again.

Building a Slotting Attachment
for the Myford M.L.7 Lathe
by "Duplex"

IN the October 2nd issue, a brief description was given of a slotting attachment built for the Myford ML7 lathe, and it is now proposed to give instructions for making this accessory. As an aid to indentifying the parts, Fig. 7 in the previous article should be consulted.

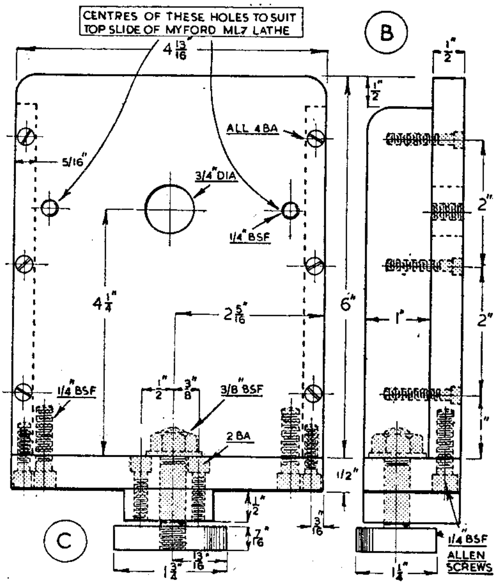


Fig. 1. *Constructional details of the bed bracket* ("*B*") and the clamp plate ("*C*")

The Bed Bracket—(B) Fig. 1

This part is of built-up construction and consists of a vertical plate to carry the topslide, a sole plate for attachment to the lathe bed, and two supporting side plates. All the parts where possible, are fastened together by means of Allen cap-screws.

After the material for the vertical plate has been filed flat on one face, the drill holes shown in Fig. 1 are marked-out and then drilled, but only a pilot hole for the top-slide pivot should be drilled at this stage, as it will be bored out later to the finished size of ¾ in.

The plate can now be secured to an angle-plate attached to the lathe saddle, as shown in Fig. 2, in order to fly-cut a flat seating for the top-slide. Next, the plate is adjusted to align the pilot hole for the pivot against the conical mandrel centre, and this hole is then bored to the finished size with a short boring tool held in the four-jaw chuck. For this purpose, the tool is finally set to the correct radius by adjusting the chuck jaws.

The next operation on the vertical plate is to fly-cut or mill its bottom edge square, as illustrated in Fig. 3.

The work is, therefore, mounted, machined face downwards, on a pair of packing blocks resting on the cross-slide. If the lower edge of the plate has been used as a datum surface for the marking-out, it is again used to set the work square with the face of the chuck.

The soleplate is made from a length of mild-steel stock ½ in. in thickness. The material can be cut off 1 in. or so overlength and then drilled and tapped at the two ends for screws to hold the work to the faceplate, or, as an alternative, two service holes can be used, but these will remain instead of being eliminated when the part is cut off to the finished length.

The plate is then machined on both sides to form flat surfaces for bolting to the lathe bed and for carrying the vertical plate. The screw holes for fixing the sole to the vertical plate are next marked-out and drilled, and the part can then be used as a drilling jig when secured to the vertical plate. The easiest way, perhaps, of holding the parts in position for drilling is that shown in Fig. 4, where it will be seen that the two components are held with toolmaker's clamps against a length of 1 in. square material; it is advisable to use a pair of clamps at either end of the work.

For aligning the bed bracket squarely across the lathe, a well-fitting tenon is secured to the under side of the sole plate.

To allow the clamp plate (C) to pinch the bed shears and so secure the bed bracket in place,

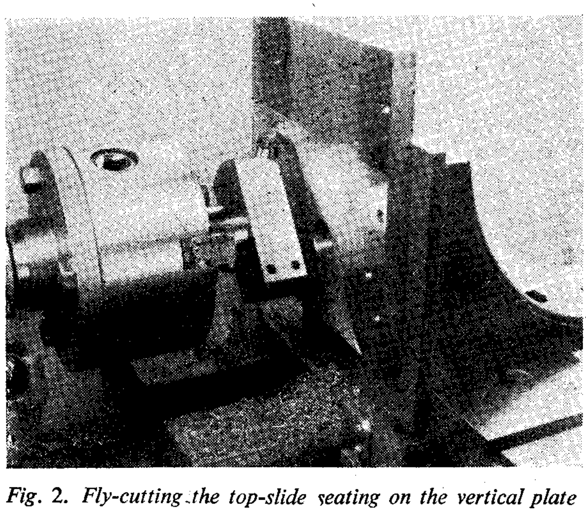


Fig. 2. *Fly-cutting the top-slide seating on the vertical plate*

the thickness of the tenon must be made some 10 thousandths of an inch less than $\frac{1}{2}$ in.

The tenon fitting should be machined parallel on its two side faces and then hand-scraped to an accurate sliding fit between the bed shears.

When attaching the tenon, it is first secured with a single screw, so that the bed bracket can be correctly aligned on the lathe bed before the second screw is fitted ; here, again, the sole-plate should be used as a drilling jig.

For securing the bed bracket to the lathe bed, the clamp-bolt belonging to the fixed steady can be used, or a special clamp-bolt, shown at (*C*) in the drawing, can be made.

At this stage, the bracket should be firmly clamped to the bed and the face of the vertical plate tested for squareness with the lathe bed.

Fitting the Side Plates

When making the attachment, the design was somewhat limited by the size of the material available at the time, and it will be noticed that the narrow side plates, fitted within the angle formed by the vertical and soleplates, have been secured by means of 4-B.A. screws owing to the thinness of the material used. However, if side plates $1\frac{1}{2}$ in. in width are fitted on the outside of the bracket, $\frac{1}{4}$ in. dia. Allen cap-screws can be used, and all the screws will then be in shear.

The point is that an attempt should be made to obtain some of the rigidity of a casting in a built-up construction, and a combination of the two methods cited may, therefore, be found the best solution of the problem.

The Driver Plate (D), Fig. 6

This component consists of a chuck backplate

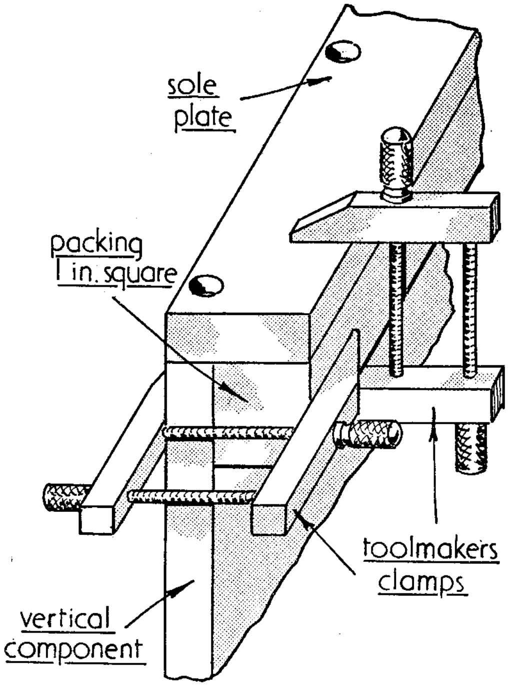


Fig. 4. Clamping the sole-plate to the vertical plate of the bracket for drilling

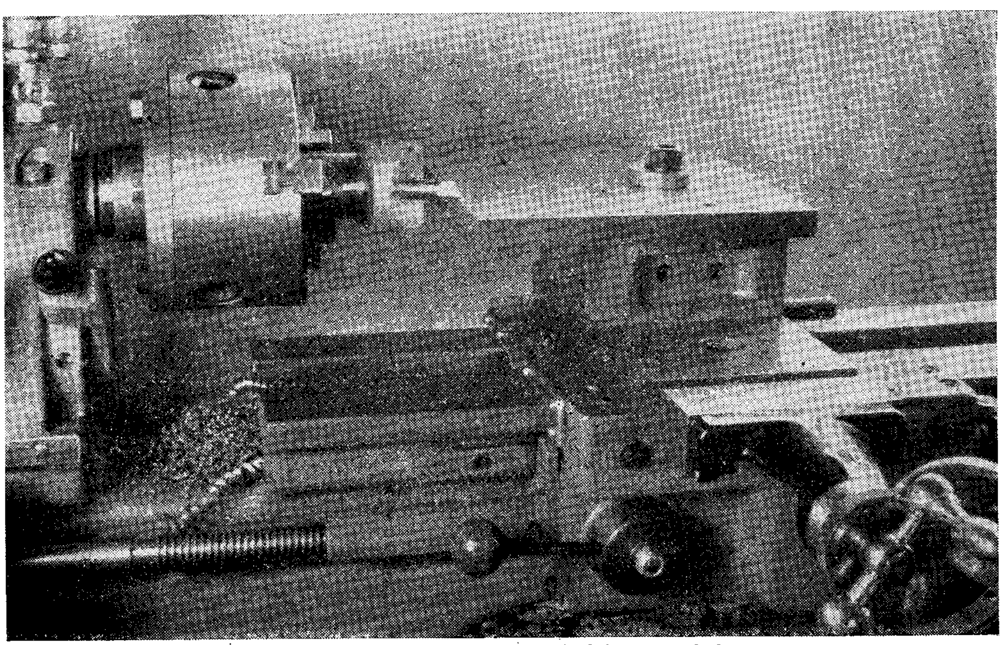


Fig. 3. Fly-cutting the lower end of the vertical plate

to which is attached a steel disc, T-slotted on its diameter to carry the head of the crankpin bolt.

Before being slotted, this disc is attached to its backplate by means of six screws. Next, the disc is secured to an angle-plate bolted to the lathe cross-slide and, after the work has been

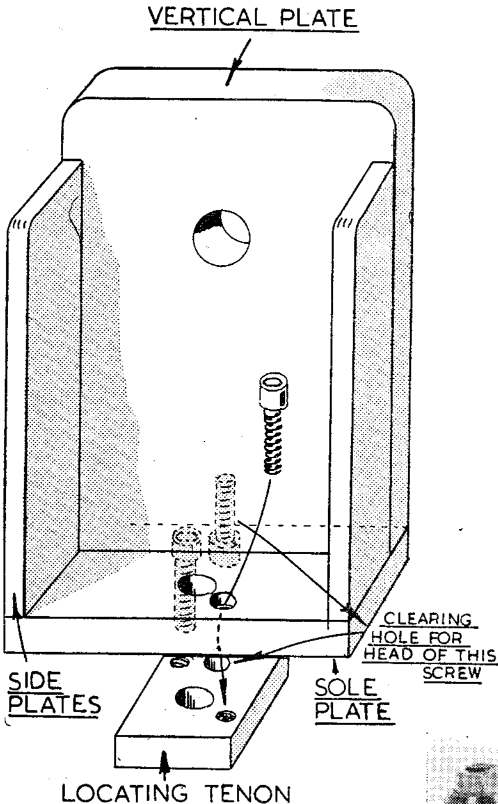


Fig. 5. Method of fitting the bed tenon

set at centre height, underside outwards, a slot is cut right across with a $\frac{1}{2}$ in. dia. end-mill to the half depth; then with a $\frac{5}{16}$ in. dia. end-mill the slot is carried right through the disc. To protect the surface of the angle-plate during the latter machining operation, a cardboard packing should be placed under the work. The two halves of the disc are then attached to the back-plate in their original positions, and a light facing cut is taken over the work. Where this plan is followed there will be no difficulty in setting the disc to run truly in the first place, and in ensuring that the edges of the slot are parallel when the work is assembled.

The Crankpin Assembly (E), Fig. 6

This assembly consists of a T-headed, central clamp-bolt, which engages in the T-slot of the driver plate, and a bush with a distance piece.

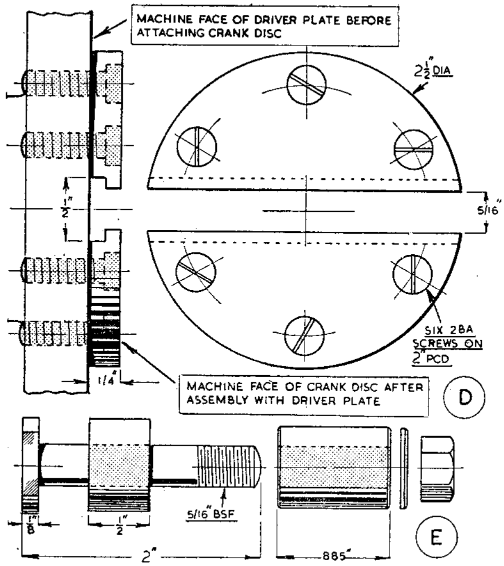


Fig. 6. Showing details of the driver plate ("D") and the crankpin assembly ("E")

This bush forms the crankpin proper and should be a close working fit in the big-end of the connecting-rod; cast-iron is, perhaps, the best material for the bush, as it will form a satisfactory bearing for the steel big-end. It is important that the faces of the bush should be square with the bore, so after the part has been bored to size and faced, it should be reversed and then mounted on a stub-mandrel for facing the other end. The distance-piece is made in the same way, but its diameter should be made equal to that of the outside of the big-end, in order to provide a working shoulder for locating the connecting-rod. If preferred, the bush and the distance-piece can be made in one, and the part then becomes a shouldered bush.

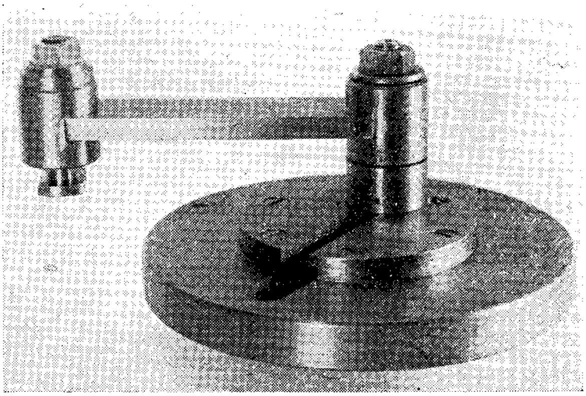


Fig. 7. The driver plate, crankpin and connecting-rod

(To be continued)

Making a Workshop Camera

by "Dioptre"

THE next part to be made is the intermediate support for the two sections of the bellows. As shown in Fig. 4, this frame is carried in the bellows fork, part *P*.

The Bellows Support—T, Fig. 47

Again, well-seasoned wood, preferably mahogany, should be used for the mitred frame.

A metal plate is attached to either side of the main frame. The purpose of these frames is for attaching the two sections of the bellows, so as to make a light-tight joint and one that can, when necessary, easily be taken apart. The framing can either be made from rabbeted material, or it can be built up from wooden strips glued together.

The inner ledge of the framing fits closely against the 6 in. wide, square bellows, and the

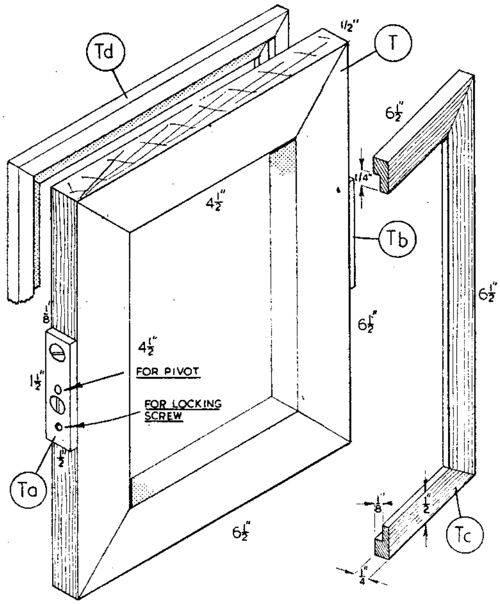


Fig. 47. The wooden frames for attaching and supporting the bellows

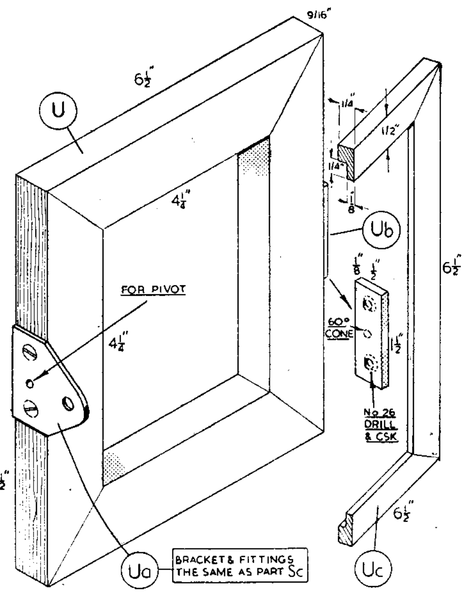


Fig. 48. The back frame of the camera and its fittings

frame, and each is drilled at its centre with a centre drill to form a bearing for the pivot-screws carried in the metal fork.

It is important to set these pivot centres at an equal distance from the lower edge of the frame, otherwise the frame when mounted in place will have a lop-sided appearance. The correct setting is easily ensured by standing the frame on the surface plate, and then using the scriber of the surface gauge to mark off the centre-lines on the plates, after they have been fixed to the woodwork. The right-hand plate (*Ta*) has an additional drilled centre to receive the point of the knurled finger-screw, fitted to the bellows fork for keeping the frame in the upright position.

This centre can be marked-out by merely tightening the screw against the plate. As will be seen in Fig. 47, a light, mitred frame is attached to both the back and the front faces of

fillet serves to hold the bellows firmly in place The details of fitting the bellows will be given later.

The Camera Back—U, Fig. 48

As well as providing an attachment for the rear section of the bellows, this assembly carries the dark slide and the focussing screen. To the mitred main frame are attached the pivot plate (*Ub*) and the quadrant (*Ua*) made to the same dimensions as those fitted to the camera front.

The frame (*Uc*) for attaching the bellows is also similar to the frame (*Tc*).

Before going further, it is necessary to obtain the actual dark slides to be used in the camera. Although suitable dark slides can be specially made, it is usually better to buy standard slides or to make use of those belonging to another camera.

Wooden, book-form slides were commonly used in British ¼-plate stand cameras, but box-form slides with thin metal shutters are to be preferred in the present instance, as they are

Continued from page 588, "*M.E.,*" *October* 30, 1952.

more easily fitted and manipulated both in the camera and in the changing bag.

The carrier illustrated was made to take the box-form dark slides supplied with the Adams Minex reflex camera ; these are very accurately made and easy to handle. Some other British cameras and those of Continental make have slides of this kind, and these can often be bought second-hand from camera dealers.

As shown in Fig. 51, what is termed a reversible back has been fitted to carry the dark slides ; that is to say, the main frame (*V*) can be removed from the camera and replaced so as to set the dark slide with the long axis of the plate lying either vertically or horizontally. On the other hand, ¼-plate, reflex cameras, suitable for Press work, are usually fitted with a revolving back that can be quickly turned into position. The revolving back rotates on a circular register, and is furnished with click stops for setting the plate. This arrangement could be fitted to the present camera, although adding some complication, and it would be found useful for setting the image exactly vertical on the focussing screen, without having either to tilt the camera or to readjust the position of the object. If this modification is made, it would be better to make the back free to rotate, so that it could be locked in any position by means of a binding-screw.

Fitting the Dark Slide Carrier—Figs. 50 and 51

For attaching the reversible back (*V*), a light frame (*Ud*) is fitted to the main frame. At the lower corners of the frame, brass catch plates (*Ue*) are fitted, and swinging latches are pivoted at the upper corners for securing the reversible back in place.

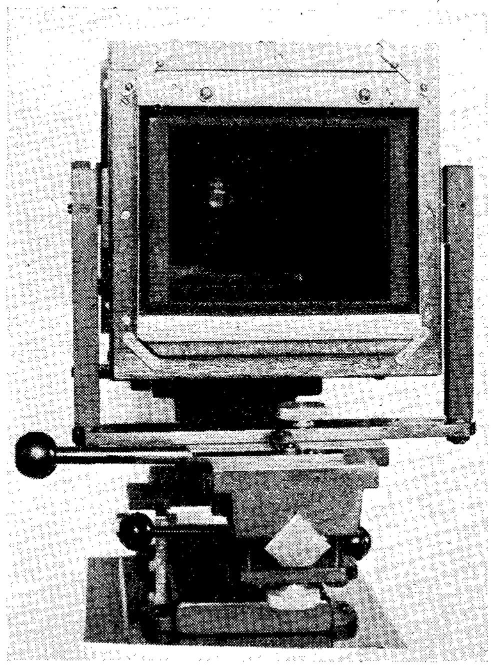


Fig. 49. Rear view of the camera, showing the reversible back

To make a light-tight joint, the back of the main frame is faced with strips of narrow, velvet ribbon glued in place.

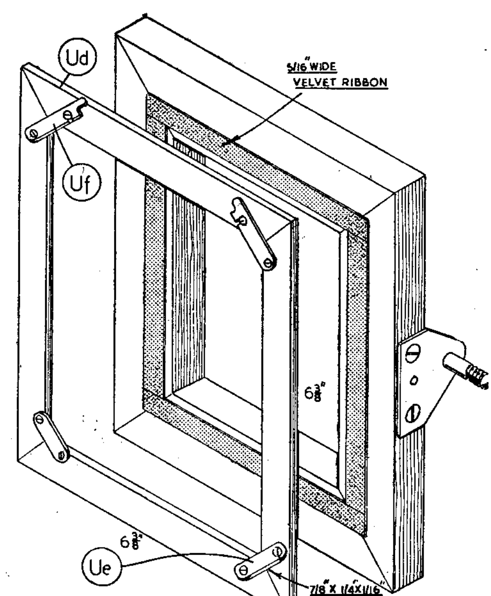


Fig. 50. The framing for attaching the reversible back

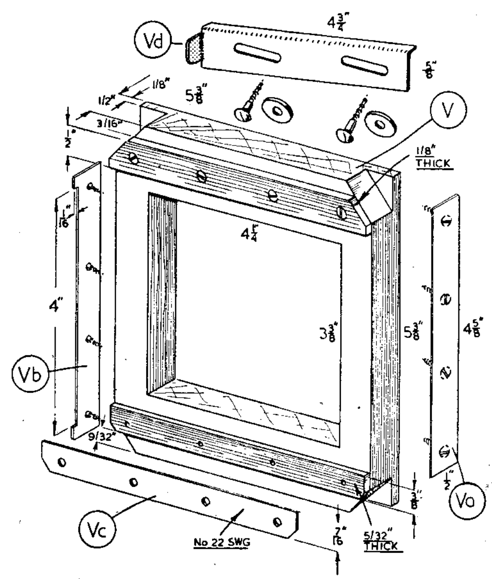


Fig. 51. Details of the reversible back and dark slide holder

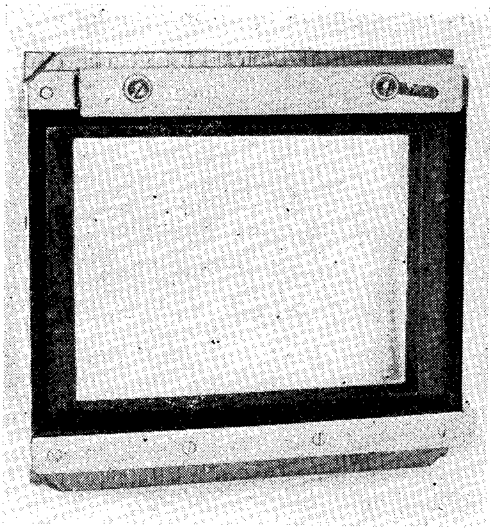


Fig. 52. The reversible back

The frame (*V*) has a central aperture, shaped to allow the full extent of the photographic plate to be exposed when the dark slide is in position and its shutter withdrawn.

Whatever the form of the dark slide used, a light beading will have to be fixed to the top and bottom of the frame to position the slide. If the dark slide is tilted, and not slid into place, an end-locating strip (*Va*) of thin brass is fitted, and at the other end the locating strip (*Vb*) is filed down to allow the slide shutter to be withdrawn. In addition, the lower, brass strip (*Vc*) forms a rabbet for holding the dark slide against the frame, which is faced with velvet ribbon. When the slide has been put in place by engaging it in the rabbet and then tilting it forwards, the upper edge of the slide is secured by means of the sliding, pressure plate (*Vd*). This pressure plate is, again, made from sheet brass, and the inclined slots are located so that, when the plate is moved to the left, the dark slide will fit into place.

On moving the pressure plate to the right, it presses the slide firmly against the abutment face, and the wood screws guiding the plate are adjusted to give the necessary pressure.

(*To be continued*)

The King's Cross Centenary Exhibition

To commemorate the centenary of King's Cross station, London, and the opening of the important Peterborough-Retford section of the former Great Northern Railway, a most interesting and instructive exhibition was staged by British Railways at the famous London terminus.

Models were a prominent feature of the exhibition, and among them the famous Stirling 8-ft. singlewheeler locomotive was represented prominently and in various sizes; unquestionably, the finest of these was the $1\frac{1}{2}$-in. scale version built by Baines Bros. of Doncaster and on loan from the Science Museum, South Kensington. We always regret that no tender was ever made to complete this beautiful model. Perhaps, some enterprising model engineer may be found, some time or other, to undertake this very exacting task.

The Ivatt Atlantic and the Gresley Pacific were also represented by some very fine models.

The characteristic G.N.R. "somersault" signal was commemorated by a very well made model in 7-mm. scale, which formed a most interesting contrast with a full-size one standing nearby. Models of coaches, wagons and, in fact, whole trains were to be seen in the same hall, together with a most valuable collection of photographs, bills, documents, original drawings and other appropriate relics.

Out in the open, farther up the street, was a collection of full-size rolling-stock, representing about 80 years of development on the G.N.R. route to the North and Scotland. The locomotives comprised: The first Ivatt large Atlantic, No. 251, of 1902; the Stirling 8-ft. singlewheeler, No. 1, of 1870, and the Gresley "A4" class, record-breaking Pacific, No. 60022, *Mallard*, of 1937. Standing in that order, they made a most intriguing display; access to the footplate of each was provided, so that visitors were able to stand in the places of many famous G.N.R. drivers and compare the degrees of comfort (?) provided on engines representing widely-separated periods of design. An excellently-preserved specimen of the 8-wheeled third-class corridor coach used on the East Coast Joint Stock trains in 1898 was an unexpected treasure, one that ought not to be lost to the future; we did not know that it existed, and we were pleasantly surprised to find it in the show.

We have mentioned some original drawings; practically all of them had never previously been outside the Doncaster drawing-office, and some of them dated back to the 1850's. Of special interest, however, was a fine black-and-white study of a Stirling 2-2-2 engine, the work of the late Sir Nigel Gresley when he was a lad of 13 at Marlborough School; which shows that the locomotive interest, especially G.N.R. locomotive interest, was fully developed in the great engineer's mind at a tender age.

The exhibition was thoroughly worthy of the important occasion that it celebrated.

" Talking about Steam——"

by W. J. Hughes

11.—The Fowler " Big Lion " Road Locomotive

AS mentioned in the last article, the springing of the front axle of the " Big Lion " is by means of a transverse leaf spring. This is held in a buckle whose sides project downwards, with a hole through each. The forecarriage fork, a strong steel casting, also has holes which coincide with those in the buckle, and the front axle has a hole, or rather a vertical slot, in the centre, which is deepened considerably in section at this point because of the slot.

The bottom leaf of the spring is forged at each end with two lugs. These extend downwards far enough to embrace the axle at each side, and are drilled for a pin on which a small roller is mounted between each pair of lugs. The rollers ride on the top of the axle, of course ; this is a typical Fowler refinement and is much easier in action than the more common sliding contact between spring and axle fitted by other makers.

Fig. 39 is a sketch of the arrangements, and it should be noted that when the pin is inserted through the holes in the fork and the spring buckle, and the slot in the axle, the top of the buckle does *not* touch the top of the fork. The axle is therefore perfectly free to tilt sideways, to allow for inequalities in the road surface.

Steerage

While talking about the front axle, by the way, the steerage arrangements may be mentioned. The steering position is on the right of the footplate, which an old driver told me was more convenient for road haulage work than the left-hand position quite commonly used by other makers, because it was easier to keep an eye on oncoming traffic. (But the last few Fowler road locomotives—*Supreme*, *Onward*, and company—were fitted with left-hand steerage.)

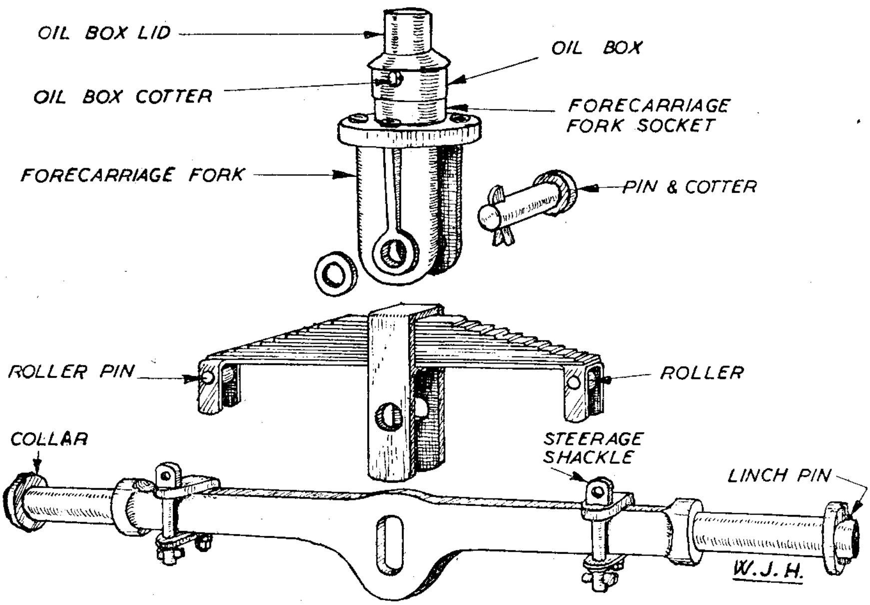


Fig. 39. Arrangement and parts of the fore-carriage. Note that this omits the spud-pan, showing front axle fitted with shackles for the steerage chain. (See text)

The spindle passes down between hind wheel and hornplate, and rotates the steerage barrel or shaft by means of the usual worm and worm-wheel. (All this detail may be seen on the general arrangement drawing published last time.) The barrel is mounted in two brackets riveted to the belly tank ; and incidentally where an oversize tank was fitted, which was quite common, the steerage spindle had to pass through a kind of tunnel formed in the tank itself, because of the width of the latter. From the barrel the steerage chains, which are crossed, pass forward, and are attached by means of adjustable shackles to an angle ring fastened to the front axle and the spud pan.

The spud pan, of course, is the bowl-shaped object clipped to the front axle, and its purpose was *not* to carry a supply of the vegetables on which Paddy and Mike are popularly supposed to exist! No, the spuds were cleats fashioned from angle or tee-iron, (the latter in Fowler's case), which could be fastened to the hind wheels to give a good grip on soft ground. On later engines which were mounted on solid rubber tyres, or converted to them, the spuds were no longer used; and so sometimes the pan and angle ring were not fitted, or were removed, the steerage chains being shackled direct to the axle, as in Fig. 39 and Photographs 13 and 14.

Reverting to the G.A. drawing, it will be noted that a short piece of curved inverted angle is fitted at each side of the ring, so as to prevent the chain riding up over the top of it.

The forecarriage fork has a stout pin projecting upwards, and this swivels in a steel casting bolted to the perch bracket, being held by a collar which is also an oil box. The latter is formed from thick steel sheet and is riveted to the underside of the smokebox.

Hind Axle Springing

The springing fitted to the hind axle is of the type known as "large movement," having up to 2 in. of vertical motion. (On the "small movement" type fitted to some makes, the allowance was only $\frac{3}{8}$ in. to $\frac{1}{2}$ in.) If you build a model "Big Lion," you may like to fit the springing, or you may prefer to omit it as an unnecessary complication—I know builders who are doing both, and the choice is necessarily up to the individual.

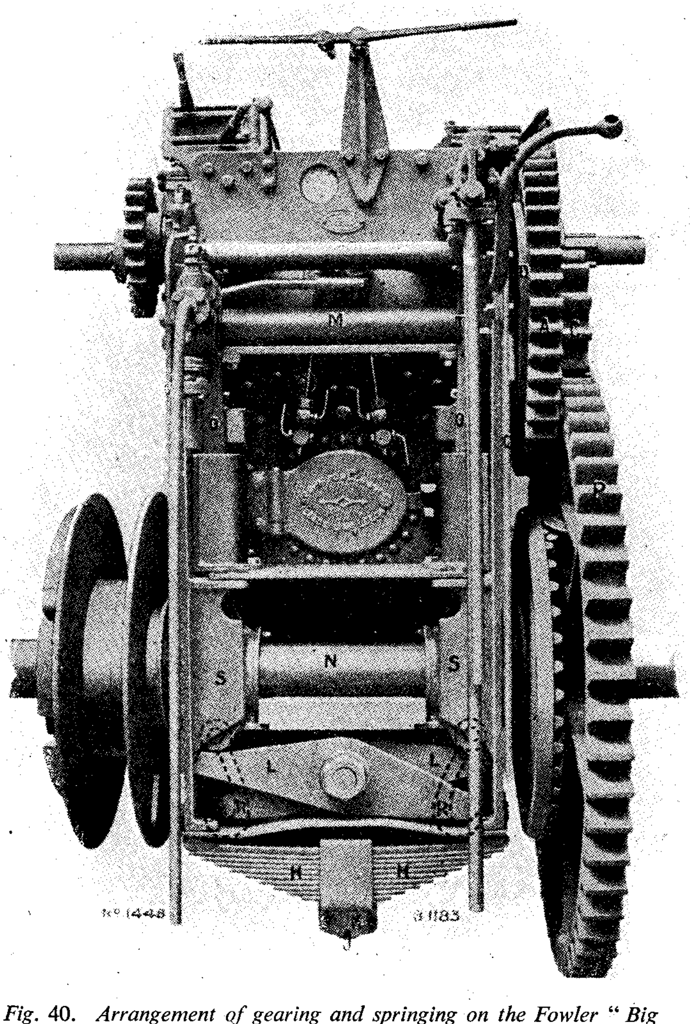


Fig. 40. *Arrangement of gearing and springing on the Fowler "Big Lion" road locomotive. (Illustration by courtesy Messrs. J. & H. McLaren Ltd.)*

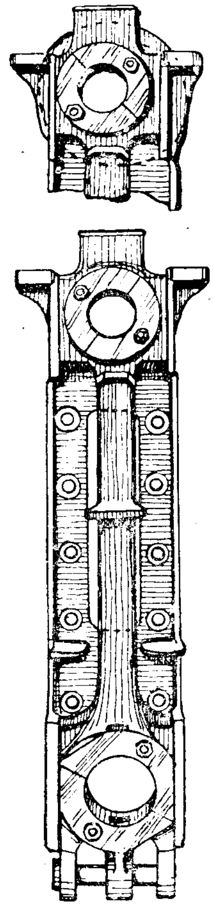


Fig. 41. *Showing how third shaft bearing and hind axle bearing are linked together to slide in the channel section horncheeks. Scrap drawing shows how R.H. horncheek is enlarged to form the boss on which the second motion spur-wheel revolves*

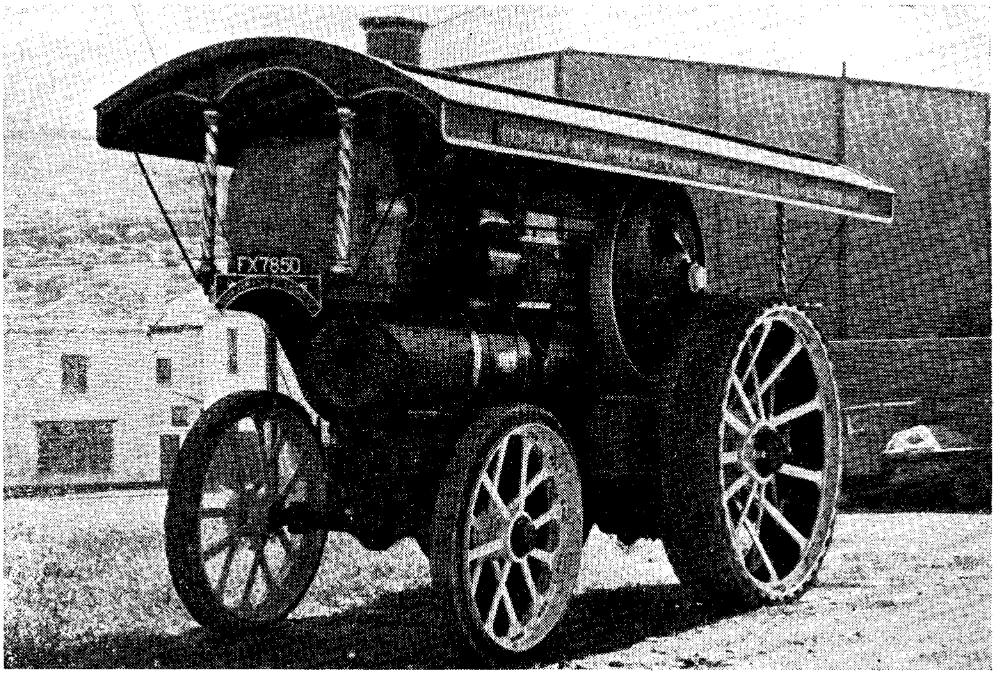


Photo by] *[Leston Studios, Portland*
Photograph No. 13. *Mr. E. D. K. Coombe's " Queen Mary," Fowler No.* 15319. *As explained in the last article, although this engine is only the " Little Lion " of* 7 *n.h.p., it would take an expert to tell the difference between her and a " Big Lion "*

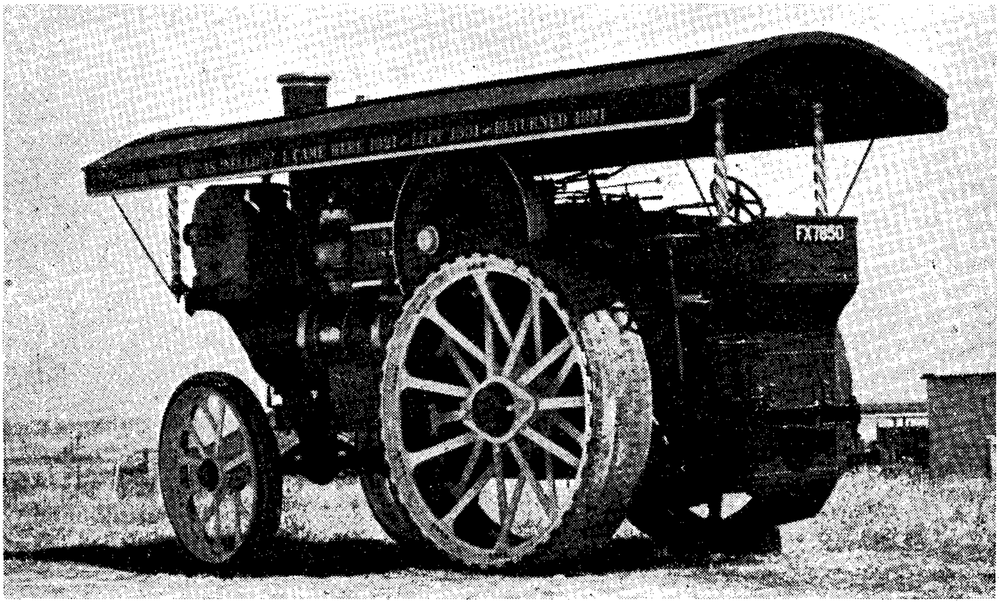


Photo by] *[Leston Studios, Portland*
Photograph No. 14. *Another view of " Queen Mary " ; note brake, fairlead, and drawbar. Note also that spud-pan has been removed, the engine having been mounted on rubbers*

But in any case, the system had better be described. The problem is to arrange for the necessary flexibility in the all-gear drive, and Fowlers overcame this with a type of universal joint in the third shaft.

Turning to Fig. 40, we see the hind axle *N* and the third shaft *M* (that is, the second countershaft) are mounted in bearings which are formed in the lower and upper ends respectively of two rigid cast-steel brackets or links *OO*. These brackets can slide freely in the vertical guides formed by the horncheeks *SS* and *TT*, which are bolted to the hornplates *GG*. (The horncheeks and brackets are sketched separately in Fig. 41.)

Then since the hind axle and third shaft are kept parallel by the links, the spur-wheel *P* and the pinion *C* which drives it are kept constantly in true mesh. (It will be as well if the reader follows this on the end-elevation in the general arrangement drawing, too.)

There are two laminated springs, one of which may be seen at *HH*, (the other being immediately

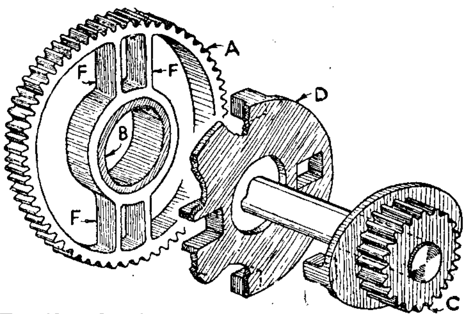


Fig. 42. Sketch to show principle of universal joint between second and third motion gearing. (See text for explanation)

in front of it, and the ends of these take the weight of the engine through the hornplates. Between the springs passes an eyebolt *J* (which may be seen better in the cross-section than in Fig. 40), its lower end passing through the centre of the spring-buckles, which are formed in one piece. The lock-nut *K* retains the springs in position and can be used to adjust their tension.

Two equalising levers *LL* are carried on the pin which passes through the eye of *J*; the "upper" end of each fits in a slot cut in hornplate and hornblock, thus taking part of the weight of the locomotive, while the other end of each is suspended by a hook *R* from the bottom of the link *O*.

Thus, when either wheel hits a bump, the "scissor action" of the equalising levers comes into play, and ensures that *both* ends of both the hind axle and third shaft *must* move vertically together. Furthermore, both shafts *must* keep at right-angles to the hornplates.

The Universal Joint

We have seen how the compensated springing works, but not explained how the vertical movement of the two shafts is fitted into the inflexible geared drive. The answer is contained in Fig. 42.

The spur-wheel *A* is driven by a pinion (not shown) on the second-motion shaft, which, of course, is driven from the crankshaft through one or other of the three-speed gears. A hollow boss *B* is formed on the top end of the right-hand horncheek (*S*), and passes outwards through a hole cut to fit it in the right-hand hornplate. It is on this boss *B* that spur-wheel *A* revolves, and the third-shaft, carrying the pinion *C*, passes through the centre of the boss and, of course, through the upper bearings of the links *OO*.

A "driving-frame" *D* is interposed between spur-wheel *A* and pinion *C*, and this carries two lugs which engage with the webs *FF* formed in spur-wheel *A*. Similar lugs on *C* engage with slots formed in *D*, and *C* is keyed to the third shaft.

Thus, since both pairs of lugs are free to slide in their respective slots, a universal joint is formed which allows pinion *C* and the third shaft to move vertically, yet still to be driven by *A*, and, of course, *C* drives the large spur-wheel which is mounted on the compensating centre which drives the hind wheels.

It must be understood clearly that Fig. 42 is only diagrammatic; in actual practice the lugs are fitted with gun-metal slippers, and the wheel *A* is well stiffened by webs. Furthermore, if you are following this out on the cross-section of the GA drawing, as I hope you are, you will notice that here the driving-disc is fitted *behind* the spur-wheel, and not between it and pinion *C*. The principle is the same, but this does enable the overall width of the locomotive to be reduced slightly.

I am using in this article a couple of photographs of the Fowler "Little Lion" (7 n.h.p.) *Queen Mary*, No. 15319. She was formerly owned by Townsends', the Southern showmen, but has been purchased by Mr. E. D. K. Coombe of Portland. He has rejuvenated her to some tune, and as the photographs show she is now in fine fettle, although on them the generator is merely a "mock-up," the original not having been available at the time of purchase. However in his last letter to me Mr. Coombe said he was hopeful of securing the genuine article.

This locomotive recently figured in an interesting incident, when at a quarry of which Mr. Coombe is manager, a large mobile crane of some 40 tons weight was bogged six feet deep in clay. An attempt was made to haul the crane out, using two 15-ton diesel wagons, in tandem and hauling in booster gear. Even with the addition of the crane's own power used on a snatch block, the diesels failed hopelessly, and a large bull-dozer was equally unsuccessful.

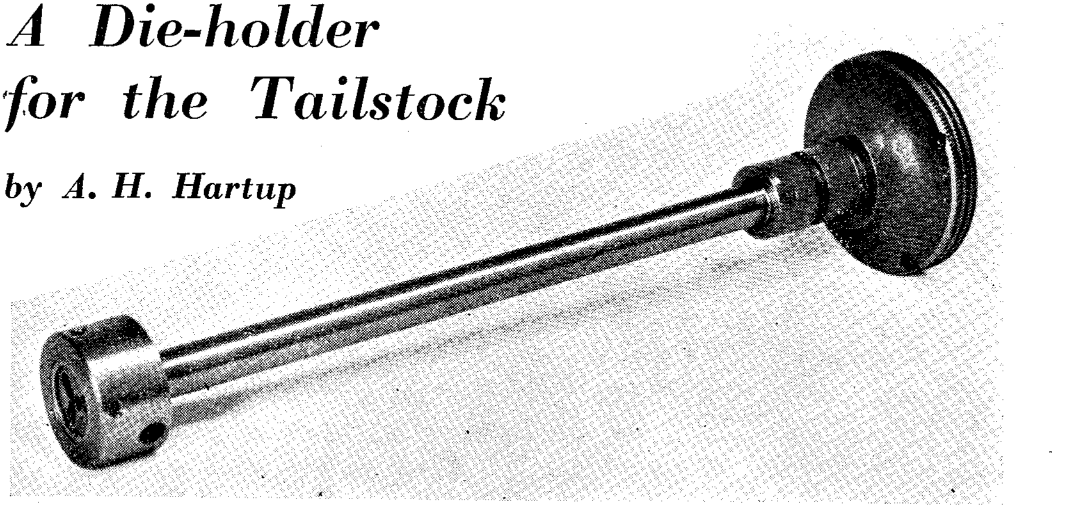
So the Fowler was steamed, and with 180 lb. on the clock, wide open regulator, and ditto simpling-valve, the old girl dragged the forty-ton burden almost bodily through six feet of rubble on to firm ground!

Not bad for a veteran of over thirty years of age, of only seven nominal horse-power! One can imagine her snorting derisively as, on her way back to her engine-house, she passed the diesels which have nearly supplanted her and her kind in the name of "efficiency."

(*To be continued*)

A Die-holder for the Tailstock

by A. H. Hartup



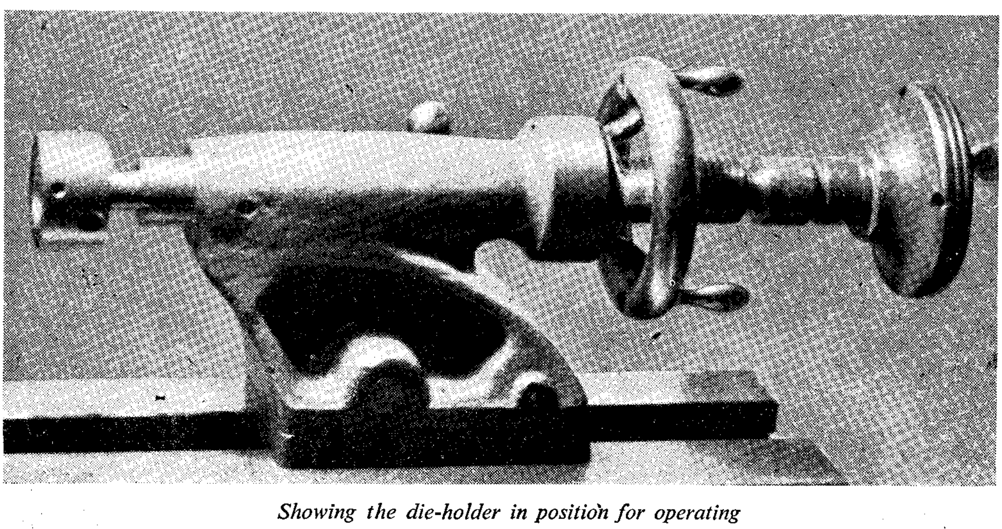
DURING the early stages of building my "Major" of the "Twin Sisters," it soon became apparent that I was in for quite a bit of bolt and special screwed-pin making. When I got down to this repetition business, the thread-cutting part of the job was started off with a die-holder guided by the outer surface of the tailstock barrel and operated by holding the levers or handles of the die-holder in the usual manner, in the rather cramped space between the two headstocks, and further hampered by the presence of the saddle and slide-rest, etc., which, of course, had the necessary tools set up in both front and back toolposts for turning and parting-off the bolts as each one was made.

This method of working is all very well for jobs which only call for a very small number of screws or bolts, but when a gross or more are required, I thought something more comfortable and speedy would be a lot better and it wasn't very long before our good "mother of invention" gave birth to another of her ideas.

This one suggested a die-holder on one end of a sliding spindle, long enough to go right through the hollow tailstock barrel with an operating handle or hand-wheel on the other end.

I made up the one described from material lying in the scrap-box. The die-head, which takes either 1 in. dies, or, with a liner or collet, the $\frac{13}{16}$ in. dies, was formed from a short end of mild-steel bar. The long spindle had been employed some time in the gearbox of a car, and the hand-wheel was originally some portion of the "innards" of a car engine.

The die-head was bored through to a close push fit on the spindle, and opened out to take a 1 in. circular die, and drilled and tapped No. 2 B.A. for the Allen screws which adjust and hold the dies. It was also drilled and tapped $\frac{1}{4}$ in. for another Allen screw which fastens the die-head



Showing the die-holder in position for operating

firmly on the spindle end. The spindle was turned all along to be a very easy, in fact, a somewhat sloppy fit, through the tailstock barrel bore. This very loose fit is deliberate, because I have found that these circular dies do not always centralise truly, so a bit of latitude is advisable in practice. The length of the spindle is, of course, decided by the length of the tailstock barrel, plus whatever amount of "fore and aft" travel is required. Mine has about $1\frac{1}{2}$ in. travel and seems to be quite sufficient for all the usual lengths of small screws and bolts required. The hand-wheel is pressed on the spindle and can be pinned as well for security.

I find this rig to be a great improvement on the previous way of working, because now, after setting up the slide-rest tools for turning and parting-off, etc., one can take the die-head off the spindle, fix the particular die required in it, pass the spindle through the tailstock barrel, fasten the die-head on the end of the spindle, slide the tailstock up to a convenient position on the lathe bed, and when the actual screwing operation takes place, the right hand can hold, turn, and control the die-head, in perfect freedom and clear of any obstruction. I drilled a hole up the working end of the spindle about a couple of inches or so, to give clearance for very long screws and to make room for the chips or swarf which may accumulate during the making of a lengthy batch of screws. The outer edge of the hand-wheel is coarsely knurled to provide a good grip when making the larger diameter screws.

PRACTICAL LETTERS

Small Flash Steam Boilers

DEAR SIR,—The makers of a fine type of light fireclay-sawdust type refractory brick have their firms at Moler Products Ltd., Hyth Works, Colchester, Essex, or Dibdale Works, Dudley, Worcs. Their type of brick can be cut with wood tools as used by joiners, and retain the heat better than plain fireclay. They are also ideal for the brazing pan. I have no connections with these firms.

Yours faithfully,

Glasgow. H. CUMMING.

The Universal Dividing Head

DEAR SIR,—In reply to the letters of Mr. Haynes and Mr. Turpin I would refer both to my original letter: i.e. one dividing plate $\frac{1}{8}$ in. thick, two fingers (combined thickness) $\frac{1}{4}$ in., one spring and one end cap will not go on a $\frac{3}{8}$-in. spigot.

Regarding the worm and wheel, I followed Mr. Turpin's instructions to the letter. After my first failure I checked everything and tried again with similar results. I then turned off the teeth and gashed again with no more success; still determined, I again turned off the teeth and gashed again, this time succeeding in holding the wheel, but the diameter was in the region of 2.1 and the teeth much too slender in proportion to the spaces. On inspection, the worm helix and space were also out of proportion owing to the tool point being too narrow and the root too shallow. A worm and wheel made to the dimensions I quoted, has the tooth and space balanced and will hold easily from start to finish.

Mr. Haynes' difficulties in gear cutting do not affect me. Being in possession of a vertical-slide I saw no reason to make the pillar, etc. I simply modified the body casting to bolt to the slide as in the Myford attachment.

In conclusion, I would like to thank Mr. Turpin—without his description I would never have dared to tackle the job. I recently cut two mild-steel ratchet wheels $2\frac{3}{4}$ in. diameter $\frac{9}{16}$ in. thick, each of 30 teeth, tooth depth $\frac{1}{8}$ in. (taken in three cuts with a home-made cutter); the results were really good.

With regard to Mr. Haynes, I have the milling attachment he is looking for, with a 1 in. diameter mandrel taking the chucks, faceplate, and bored No. 2 Morse, but driven from an overhead gear.

I have just moved into a new house, and if he could call on me or wait until I have finished the most essential jobs I would be pleased to meet him.

Yours faithfully,

Huddersfield S.M.E. EDWARD HALL.

Fixed Steadies

DEAR SIR,—I yield to no-one in my admiration for "Base Circle" if he hack-sawed a fixed steady from 1-in. steel! Unfortunately, not many of us have access to the "magic bottles," and the labour involved in such an undertaking is, to my perhaps lazy mind, appalling.

Anyway, I needed a fixed steady, and was unwilling to pay the high price asked. I made wood patterns for a hinged type, leaving hinge lugs solid to avoid cores, and a local foundry cast for me. The two parts cost me 7s., and sawing out, etc., to make the hinge and fastening pin was little trouble. I'm sure this way is very much easier than "Base Circle's," and possibly cheaper, too. To my mind, also, a better article is produced.

Yours faithfully,

Birmingham. EDIE G. WILLIAMS.

Locomotive Valve-Timing

DEAR SIR,—I was very interested in "S.W.C's" letter and agree that his use of the sine curve does show the valve events very clearly, but the Zeuner diagram gives them quite accurately and is much quicker and more certain to draw; so I think this fully justifies its use where one has to make a number of comparative diagrams.

May I point out that "S.W.C." has made a slip in labelling the lead measurement; it should be the vertical distance between the lap line and where the derived curve crosses the dead centre-line.

Yours faithfully,

Bexhill-on-Sea. C. M. KEILLER.

Cleaning Glass-Case Models

DEAR SIR,—I wonder if other owners of working mechanical models, particularly those of the glass-case variety, have been troubled as I have, by the gradual formation, over the years, of a hard intractable yellow-brown skin creeping over much of the polished steelwork, especially in the more inaccessible places, due to old oil residues settling and drying on. In time, this discolouration so caused, quite seriously impairs the appearance of a fine model, and for a long time I have been trying many would-be remedies in vain.

Recently, however, I was recommended by a well-known industrial chemist to the General Metallurgical & Chemical Co. Ltd., Finsbury Pavement House, Moorgate, E.C.2, who were good enough to send me a sample of their product "Oxitol" to try. The result of using it was almost miraculous. It only needed brushing in cold with a fine brush to get rid of all the hard and hitherto insoluble and unsightly blotches, and restore the steel work of my models to its original state. It leaves no ill effects that I can discover, though, of course, care in use is necessary, as it will also remove paint and lacquer if applied too indiscriminately.

I feel sure that other owners of models would like to know of and use this solvent, if it were available in small quantities—(2 oz. to 4 oz. is ample for the average user in our range).

The producers tell me they cannot undertake retail sales of this order and there is at present no distributor in this country dealing in 4 oz. & 8 oz. lots. They would prefer, however, that some shop or firm specially catering for model engineers should order a few gallons from them, to break down for distribution in small bottles.

"Oxitol," would, I feel sure, prove a godsend to curators of many museums containing mechanical exhibits. Even at the Science Museum at South Kensington, fine models and other pieces of mechanism can be seen sadly discoloured in this way.

I should add that I have, of course, no personal interest in this matter other than the wish that others may benefit, as I have, from its use.

Yours faithfully,

London, S.E.3. WM. T. BARKER, S.M.E.E.

[*Editorial Note*: We learn from the makers of "Oxitol," General Metallurgical & Chemical Ltd., Finsbury Pavement House, 120, Moorgate, London, E.C.2, that they are prepared to sell small quantities, i.e., 1-lb. lots, at an inclusive charge of 12s. 6d., packed and delivered to any address in the United Kingdom upon receipt of remittance.]

CLUB ANNOUNCEMENTS

The Society of Model and Experimental Engineers

There will be an informal meeting of the Society at Caxton Hall on Saturday, November 15th, at 2.30 p.m. This will give members an opportunity to meet and engage in the discussion that are so curtailed at the usual meetings.

Members are reminded that there are still a few vacancies for the visit to the L.P.T.B. Training School at Lambeth on Friday evening, November 14th, at 6 p.m. Those desiring to be included in the party should notify the Secretary without delay.

Full particulars of the Society can be obtained from the Secretary: E. C. YALDEN, 31, Longdon Wood, Keston, Kent.

S.M.E.E. Affiliation

The Affiliation Committee, having considered a suggestion made at the 1952 annual general meeting, have requested Mr. S. L. Redshaw, chairman of Grantham S.M.E., to take preliminary steps towards forming a branch in the East Midlands area. This is an experiment, the object being to enable provincial societies to take a greater part in affiliation activities, and to organise services such as the "locomotive driving test" scheme on a regional basis. It is hoped to arrange a meeting in the area, (probably at Grantham) in the near future, to discuss details; in the meantime it will be much appreciated if club secretaries in the Notts-Lincs-Derby-Leics-Northants area will contact Mr. Redshaw, at 191, Harrowby Lane, Grantham. This applies not only to societies now affiliated, but all others who may be interested in the proposal.

For the information of clubs not already affiliated, the aims and objects of the S.M.E.E. affiliation are to encourage model engineering in all its phases and in particular the formation of panels of lecturers and judges, timekeepers, etc., co-ordination of exhibitions and interchange of news bulletins, holding of "affiliation days," loan of books from the extensive S.M.E.E. library, and technical advice from a panel of experts. Locomotive driving tuition is available and as already stated driving certificates are issued after passing a test. Each affiliated club receives free of charge three copies of the S.M.E.E. Journal. Annual subscription is £1 for clubs with 20 or more members and 10s. for clubs with a smaller membership.

Hon. Secretary: J. W. REED, 185, Windmill Road, Hemel Hempstead, Herts.

Southend Model Railway & Engineering Circle

The following meetings have been arranged:

November 18th: Lantern talks (L.P.T.B.).
December 8th: Second talk by Mr. H. Price (B.R.).
January 13th: Annual general meeting, 7 p.m.
January 29th.: Mr. Rimmer "Model Photography."
February 28th.: Sound films (B.R.).
March 25th: Mr. Roomes "Model locomotive construction."

May onwards, 3½ in. and 5 in. Live Steam classes, etc. We share our meetings with the S.M.P.B. Club (power boats).

For those club members living in the Westcliff and Leigh districts, further club information can be obtained at the Paramount Model Shop, 695, London Road, Westcliff. Those members in Southend, Shoebury and Thorpe Bay district can get information from The Hobby Store, Victoria Arcade, Southend. Both these address have a club notice board and supply rules and entrance forms, etc.

Hon. Secretary: ALAN L. HOPPER, 14, Sherbourne Gardens, Southend, Essex.

The Tonbridge and District Model Railway Club

The above club's future activities are as follows:

November 20th: Bridges, F. S. Bond.
December 4th: Painting and lining 4 mm. locomotives, R. J. B. King (Medway Engineering Society).
December 18th: Timetable working. H. Weskett.
January 8th: Silver soldering, A. C. Gale.

The Social Centre, Tonbridge, has been booked for April 27th to May 3rd, 1953, inclusive, for our next exhibition.

Any prospective member can obtain full particulars re the club from the Hon. Secretary, 185, High Street, Tonbridge.

Birmingham Society of Model Engineers Ltd.

"Surprise Night," held at the White Horse on October 15th, was an enjoyable evening and we offer it as an alternative for other clubs. All members are given a slip of paper and requested to write their names. The slips are placed in a hat. The chairman pulls out one and calls the name. The member then gives a five minute spontaneous speech on any subject. A great amount of fun and information followed. It can be recommended to any society requiring a change.

Hon. Secretary: R. PHILLIPS, 92, Gibberstone Avenue, South Yardley, Birmingham, 26.